SUPPLEMENT.

The Mining Journal,

RAILWAY AND COMMERCIAL GAZETTE:

FORMING A COMPLETE RECORD OF THE PROCEEDINGS OF ALL PUBLIC COMPANIES.

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THE SCHOOL OF MINES, ANDERSONIAN UNIVERSITY, GLASGOW.

This school has just completed the second year of its operations. The annual examination of students from written questions and answers, and from drawings of pit machinery, and from plans and sections illustrating the working and ventilation of mines, was brought to a close on Wednesday, and prizes awarded by the committee to six of the students, according to the merit of their papers and drawings, were then presented. All auxiliaries that can be brought to bear upon improvements in the safe management of mines generally, and of coal mines especially, cannot fail to meet with the approbation and best wishes of every right-minded individual, and that an institution of this kind is well calculated to render very important aid towards advancing both safety and economy in mining operations is what must be admitted by everyone, and most readily by those who are best acquainted with the practical details and dangers of coal mining. It is well known that mere class-room instruction, however well it may be given, can never produce properly qualified colliery managers, but when we can combine the lecture, the drawing-board, and the *pick*, and develope by practical training that peculiar tact or *naiveté* so requisite in successfully directing work and managing men, the right place and proper value and importance of mining schools are then clearly established. The following report will show that the committee of the Glasgow School are working in the right direction, and that so far they have met with a very encouraging degree of success.

Glasgow Mining School—Report of the Committee of Management for the Year ending Nov., 1861.—The committee have much pleasure in being able, on this occasion, to present to the subscribers a very favourable report of the progress made, and results obtained, by the school during this, the second, year of its existence. In the report of last year it was stated, as a reason why such an institution as this should be founded and supported, that the rapid extension of the coal and iron trades of this country had created an extraordinary demand, and consequently a deficient supply of properly qualified men for efficiently conducting the underground practical operations of mines and collieries; and, as this state of matters still exist, the same reason may yet be urged in favour of its continuance, and for support and encouragement to it in the future. The number who have entered the school as students since its commencement, two years ago, is 57, of these 10 have continued in tolerably regular attendance for the whole of the two years, and the total average attendance, although below what might have been expected from the number of entries, has yet been as high as could have been anticipated under the circumstance. About 47 have attended the classes regularly during periods ranging from six months to two years; the remaining 10 seem either not to have commenced their studies at all, or to have remained in the class during a week or two only. The arrangements for the classes remain the same as stated in the last report—two classes each day for five days in the week. The first commences at 10 o'clock A.M. and continues till 1 o'clock; and the second commences at 3 o'clock P.M., and continues till 6 o'clock P.M. The scale of fees is for workmen 6d. per week, and for others, not relying on their own efforts for support, 6*l*. per annum.

The subjects to which the attention of the students is chiefly directed are as follows:—

1. Means of searching for coal by a geological examination of a district, and by the various methods of boring.
2.—Sinking, walling, tubbing, and barring of shafts.
3.—Drainage of mines by levels and machinery, construction of dams in mines, &c.
4.—Methods of working coal and other minerals. 5.—Ventilation of mines.
6.—Timbering and other means of supporting the roof and walls in mines.
7.—Transport of minerals above and below ground.
8.—The principle and construction of the steam-engine.
9.—Practical mechanics relating to the estimation of work done, &c.
10.—Mineral surveying, levelling, and plan and section making.
11.—Mechanical and other drawings, illustrative of mine engineering.

Mr. Fryar gives oral instruction in one or other of these subjects for an hour each day to each class; in the morning from 10 till 11 o'clock, and in the evening from 5 till 6 o'clock; the remaining portions of time being devoted to mechanical drawings, and to making plans and sections of the working of mines. It will be obvious to everyone conversant with mining operations that a knowledge of the subjects above enumerated is highly necessary to every man who may be entrusted with the conduct and management of such operations; and inculcated and enforced as these subjects are by Mr. Fryar's effective mode of teaching, they cannot fail to enlighten, inform, and fit students for the important and peculiar duties required of mining managers, and with such men in the underground management useful improvements in the safe and economical working of mines may reasonably be expected to result. Every mineral owner will acknowledge the necessity and demand for such skilled men, and the truth of this necessity receives strong confirmation from the fact that, notwithstanding the short period of the school's existence, it has already been largely drawn upon for a supply of such men. Of those who have attended and availed themselves of the instructions given in this school, at least eight of them have received appointments either as underground managers or have got other situations of responsibility and trust in connection with mines and collieries. All these men, with the exception of one or two, belonged to the class for whom the benefits of the school were originally intended—viz., working miners. It is very gratifying to see that the utility of the school is thus beginning to be appreciated in the proper quarter, and although time may be required to thoroughly establish its merits, it may confidently be predicted and relied upon that the superiority of such men, having the advantage of all the scientific and useful knowledge to be had in this school, will in due time assert itself, and command the attention of employers and all concerned; and it is to be hoped that all parties will be induced thereby to promote the success of the school, by encouraging its students, and by every other means in their power.

THE PRESENTATION OF PRIZES.

This took place in the class-room, in presence of the committee and a number of gentlemen connected with mining operations in the neighbourhood of Glasgow—Mr. James Merry, M.P., acting as Chairman.

The Chairman addressed the class, saying:—Students—It is just twelve months today since I had the pleasure of attending the first examination of this school. I am glad to have it in my power to be again present, and to see the satisfactory progress you have made in all the branches of education taught by Mr. Fryar. The committee appointed to make the preliminary examination of your drawings, your written answers to the several questions on ventilation, and the different methods of working coal, and other mining subjects, have reported favourably of the progress of all; and I have now much pleasure in handing the prizes to the six students, selected by the committee, whose names now stand at the top of the list. These prizes will testify to you that the mineral owners and the iron and coalmasters who have promoted the establishment of this school, continue to take an interest in its success; and I trust that you will on your part, when you go into situations as managers, or to be otherwise engaged in mining operations, so conduct yourselves as to maintain the credit of the school, and keep up the fair start you have now made. It cannot but be gratifying to the subscribers and to the executive committee—I am sure it is to myself—to know that already eight or nine of the young men attending it have found situations as managers of collieries and ironstone mines. I would say to you, however, that you should not depend too much on getting situations merely because you have attended the Mining School; on the contrary, you ought, while carefully noting and storing up in your minds what Mr. Fryar teaches you as the first principles of mining, never to forget that, after all, "practice makes perfection;" and, therefore, I would earnestly advise you never to neglect any opportunity of acquiring practical experience in the winning and working of minerals in all its details; as that, combined with the information here obtained, will do more for yourselves, and be of greater advantage to those who may employ you, than if your time and thoughts were too much taken up with the theory alone. I now bid you good-bye, with best wishes for your future welfare and success in the calling you have chosen.

The committee had previously examined the practical drawings made by the students, and exhibited in competition for the prizes offered, as also the written answers by the competitors to questions submitted by the committee. The whole being taken into consideration, and the result announced, the following prizes were awarded, and delivered to the respective successful competitors:— [Merry, M.P.

1. To James Morton, Summerlee Ironworks, a Mining Compass; presented by Mr. Jas.
2. To Archibald Cunningham, Dalry, a Set of Drawing Instruments; presented by Mr. James Hunter, Coltness. [son, Lesmahagow.
3. To Richard Nisbet, Govan, Four Books on Mining; presented by Mr. James Ferguson.
4. To Thomas Thompson, Nitshill, a Clinometer; presented by Mr. John Galloway, Kilmarnock. [Inspector of Mines.
5. To James M'Killop, Slamannan, a Hygometer; presented by Mr. Wm. Alexander,
6. To John Wyper, Chapelhall, a Set of Pocket Compasses; presented by Mr. John Mackenzie, Dundyvan.

Mr. Richard Nisbet thereupon addressed the committee on behalf of himself and his fellow-students, expressing their sense of the liberality evinced by the institution of the school, and the personal trouble taken by the gentlemen, and acknowledged the prizes awarded. In the course of his address he referred, first, to the humanity which had influenced the subscribers in promoting such an institution; second, the philosophic views upon which it was founded; third, the spirit which had been thus exhibited by the learned, the wealthy, and the benevolent, who had vied with each other in their efforts to elevate those working men who possess the desire of elevating themselves. He referred to the general aparthy in the mining population with regard to education, but hoped there were among them many who were actuated by high motives, and to whom such an institution as the present was of the greatest value; and concluded an animated address by assuring the committee and subscribers that, for the advantages thus placed within reach of the students, and which they could never have secured otherwise, they entertained the deepest gratitude.

Thereafter an oral examination upon questions put by Mr. Fryar, the master, and different members of the committee, took place, when the students showed, by answers given on the spur of the moment, that the knowledge acquired by them was of a truly practical kind.

Mr. Hunter proposed a vote of thanks to the Chairman for his attention to the interest of the school and conduct in the chair, which was unanimously agreed to.

Miners' Association of Cornwall and Devon.—At the quarterly meeting of this institution, the Rev. E. T. Treffry, who presided, delivered an eloquent address upon the prospects and advantages of the association. After justifying the non-establishment of a Mining College in Cornwall, and referring to the probable causes of the failure of the Mining School at Truro, he continued:—"I say that instruction must be brought to the doors of the miners, and then we may confidently anticipate that they will avail themselves of the advantages offered, but to establish one large college or institution in some particular locality, for the whole county, would be tantamount to the withholding of the instruction from all except those who resided in the immediate district. Now, this is what our association is doing—carrying instruction to the doors of miners, and so far its success has been highly gratifying. Another observation which I will make is this—I have heard it stated that the acquirements of our mine captains and agents in this county are at a low ebb. If I am wrong I am open to correction. We sometimes find an advertisement inserted in the newspapers for a mine captain possessing certain qualifications, to go to a certain place, and that advertisement is continued two, three, and four weeks, showing that the appointment has not been filled up. Then, there is the captain of a mine with which I am connected, whom we consider as one of the best miners in the county, but you must stop there; he knows nothing about dialling. I will mention no names, but I know another captain, who is an excellent miner, but he also knows nothing about dialling, and a dialler had to be employed; but the captain, knowing nothing of dialling, had no check upon him. The result was that the adventurers lost hundreds and hundreds of pounds by his incorrect and unfair dealing. I only allude to that one branch among many of which I am afraid our mine captains are ignorant." He considered that this ignorance arose from want of instruction, and he believed that the instruction furnished to the mining community by the instrumentality of the Miners' Association of Cornwall and Devon would be the means of giving them much better agents, men, and boys. With respect to the progress of the association during the past quarter, Mr. R. Pearce, jun., reported:—"Since the annual meeting Mr. Twite and myself have been engaged in giving instruction in the districts of St. Just, Redruth, and Camborne. At the former place the number of students is increasing, and Mr. Twite's lectures on mechanics have been much appreciated. My course of lectures at Redruth has just terminated; it extended over a period of two months; members have increased, and the interest felt in the branches of science bearing on mineralogy and chemistry is shown by the regular attendance to the lectures. The number of class students is 26, and the average attendance during the whole course has been about 20. I shall hold an examination on this evening, the result of which I hope to bring before our next meeting. I cannot, I am sorry to say, speak so encouragingly of our class at Camborne, the average attendance being only seven; my course of lectures will terminate there in about three weeks. The class at St. Agnes is working effectively; the members are regular in their attendance at the class-room, where they pursue their studies and carry on investigations of a practical character, bearing on those subjects which have been brought before them from time to time by Mr. Twite and myself. They receive regular visits from us once a fortnight. The class at Tywardreath, which was formed about twelve months since, is still in active operation; the number of members who meet for mutual instruction is not large, but those who attend are persevering in their endeavours to acquire information on those subjects having a practical bearing on mining and mineralogy. I visit them once every three weeks. A short time since I received a letter from the Rev. J. Bannister, of St. Day, requesting my assistance in the formation of a class in connection with our association in that district. I accordingly visited them, and gave a lecture to an audience consisting of miners, mining agents, &c., when it was arranged that a class should be established as soon as possible. About twenty names have already been promised, and I hope to commence a course of lectures there very shortly. Our educational plans are, I believe, working in a most effective and satisfactory manner." Papers were afterwards read—On a remarkable Mineral Deposit in Devon, by Mr. John Simmons, mineral agent of the Duchy of Cornwall; On the Mineral Districts of St. Austell, illustrated by a map or plan exhibiting the character of the deposits from St. Stephen's Coombe to Fowey Consols, by Capt. R. H. Williams; On the Cornish Steam-Engine, by Mr. Jas. Sims, of Redruth; On the Economy of Superheating of Steam-Boilers, by Mr. L. E. Fletcher, chief engineer of the Association for the Prevention of Steam-Boiler Explosions at Manchester; On Smyth and Wasley's Machinery for Spalling and Separating the Ore from the Stone, &c., by the inventors; and On the average Age of Cornish Miners, by Mr. R. Q. Couch, of Penzance.

Cornish Mining.—At the Civil and Mechanical Engineers' Society (Mr. F. Campin, president, in the chair) a paper was read on "Cornish Mines," by Mr. Wm. Gill. The author commenced with an historical notice of the method of working mines from the time when the Phœnicians first discovered tin in Britain. He then described their gradual progress, and the vicissitudes through which they passed, up to the present time, giving an account of the machinery used prior to the use of gunpowder and steam, concluding this portion of his paper with the history of the application of the latter to mining purposes, both for drainage, raising stuff, and for working stamping and crushing machinery, &c. He then described the nature of the various fissures or lodes containing the mineral, together with the phenomena and the faults, or dislocations, to which they are subject, giving an account of the methods of their discovery, such as dowsing, shoding, costeaning, &c.; and then treating of their working—sinking shafts, driving levels, cross-courses, and adits, and blasting the rocks. Then passing to the raising of the ore to the surface, he compared the uses and advantages of the kibble and skip, advocating the use of the latter in deep shafts, where they descend perpendicularly, or where the underlie is regular. He also described the man-engine, and its efficiency for the ascent and descent of the miners; and gave an account of the peculiarities of the Cornish engines and boilers, and the manner of working the pumps and pitwork. The surface work then followed, with descriptions of the various machinery used, including Mr. Hollow's buddle and Mr. John Hunt's jigging machine, the latter being able to dress a cubic foot of very poor stuff in 65 seconds, with only two boys to attend to the machine; the paper ending with an account of the economic management of the mines, the description of labour employed, and its remuneration. A discussion then ensued upon the comparative strength of hempen and wire-ropes and chains for raising the stuff; also, on the applicability of wire-ropes, with beams at the top and bottom of the shaft for working the pumps, instead of the wooden rods used at present. In this discussion, the President, Messrs. C. B. King, J. B. Wildish, F. Gill, Roberts, Tough, A. Fairlie, W. Dempsey, and Bonnett, took part.

Pyrites.—At the Literary and Philosophical Society, Manchester, Dr. Crace-Calvert said he wished to draw the attention of manufacturing chemists to a very simple and rapid method which had been devised by the eminent chemist M. Pelouze, Master of the Paris Mint, for determining the amount of sulphur existing in pyrites. He (Dr. Calvert) was induced to do so, believing that any process which would simplify the long and troublesome operations now followed to ascertain the value of this mineral would be useful to many members present at this meeting. The process consists in mixing intimately together one part of pyrites, thoroughly pulverised in an agate mortar, with five parts of carbonate of soda, seven parts of chlorate of potass, and five parts of chloride of sodium, and placing the whole in an iron spoon, which is gradually carried to a dull red heat. The mass, when cold, is first washed with cold water and then with boiling water, until the whole of the soluble matter is removed; and this solution is tested with a standard solution of sulphuric acid. As 100 grains of carbonate of soda require 92·45 of monohydrated sulphuric acid, or $S\,O^3\,H\,O$, it follows that the quantity of soda in the carbonate of soda employed will decrease in proportion to the quantity of sulphur from the pyrites converted into sulphuric acid, which will have neutralised a corresponding quantity of the soda in the carbonate. This mode of assaying is so simple that the author states that he can determine within 1 or 1¼ per cent. the value of a sample of pyrites in the space of an hour's time. M. Pelouze also states that by employing the following proportions of the same materials, the manufacturer can determine the amount of sulphur in burnt pyrites. Five parts of the latter substance are mixed intimately with five parts of pure carbonate of soda and five parts of chlorate of potash.

Mr. Edward Lacy exhibited two specimens of lead ore (galena) from a vein which cuts in nearly a vertical direction, through a seam of coal at Axe Edge, Derbyshire. The coal is 60 yards above the limestone, and, where in contact with the lead, it is not charred or altered in any way, clearly showing that the lead was not introduced in a heated state. The vein of galena is about 3 in. in thickness, and is contained in a fracture of the strata, or fault, which passes through the rocks above and below the seam of coal. It has been followed about 15 yards above the coal, without presenting any indication of swelling out to a workable thickness; but at present it has not been examined below the level of the coal, on account of the accumulation of water in that direction.

Mr. Binney stated that he had described a similar vein found in Mr. Gisborne's colliery, at Horwich, near Whaley Bridge. The strata there and near Axe Edge were in the same geological position—viz., the Rochdale series of coals. The bed of coal where the lead was found might be only 60 yards in horizontal distance from the limestone, but in vertical distance it would be near 2000 ft. The Whaley Bridge vein is fully described in his paper printed in the Memoirs of the Literary and Philosophical Society.

OBSERVATIONS on the COAL MINES of BELGIUM—No. III.

Before passing to the other methods of working, and in order to give a general idea of the surface arrangements in this district, I will give a short description of the manner in which the work is performed at bank at one of the pits of a colliery (Levant du Flénu) I visited in the neighbourhood of the one just mentioned. I was informed that the pit was 400 metres deep. The cage is raised from the bottom to the keeps in 60 seconds, and the four tubs changed in 30 seconds; total time of trip, 90 seconds. The breaksman commences to slacken when the cage is about 30 yards from day. The cages are, as usual, of four stories, stopping, however, only twice on the keeps, as there is an upper staging built around the pit mouth, so that when the lowest tub is being withdrawn from the cage on the main heapstead the *third* one is taken out on this upper platform, and when the cage is let down again on the keeps to take out the *second* tub, the fourth, or highest, tub is simultaneously withdrawn above. The two tubs left on the upper staging, or heapstead, are then sent down to the kick-ups in a balance worked by a counter weight, which serves to bring up the two empty tubs with which to replace the full ones drawn out next time. At some collieries these elevators are self-acting. The whole establishment, pulleys, heapstead, screens, &c., is built in under one roof. The screens are very broad, and stand at an angle of about one in two, having openings of about 3 centimetres. The upper end of the screens is on a level with the kick-ups, and the lower rests on a floor some 5 ft. below the level of the pit's mouth. On this floor stand the girls and women, who pick over the coal as it descends, a long rectangular slit being cut through the planks, for the purpose of pitching the large coal through into the wagons below. Nuts are sometimes made, but not by means of the so-called "apparatus" of the North of England, which is here replaced by a *double screen*, the under one being considerably finer than the upper. The manipulations to which the coal is subjected are as follows:—When the contents of a tub have been discharged upon the screens a band of females, armed with iron rakes, precipitate themselves upon the sliding mass, dragging it down with the greatest activity, and giving it a sort of rough separation as it falls. Other females, girls about 14 to 15 years of age, then pick it over with great rapidity, throwing the stones behind them, selecting out the very large lumps (*gaillettes*), which are placed in small baskets, and carefully handed down through other openings cut in the floor into the railway wagons standing underneath. The rest of the coal that remains above the screens is then examined; that which is too small is thrown under the seams as fine, and the rest, which constitutes what are called *gailleteries*, is raked through the slit already mentioned into the wagons waiting underneath to receive it. Whenever it is necessary to load coal from one wagon to another it is re-picked, so as to prevent the mixture of small coal with the large size. The females who pick over the coal receive I fr. per 600 tubs picked over, which quantity is their fixed minimum day's work; but by working longer hours they make from 1·40 to 2 frs. per day. They are divided into two companies, picking alternatively 50 tubs, and then resting until their turn comes up. They work with unremitting industry, for when the tasks are not accomplished more hands are put on, and the pay remaining the same, their daily wages are diminished by being divided among a greater number. The banksmen have 35 centimes per 100 hectolitres taken out of the cages. The 4-hectolitres tubs are of wood, about 1·30 metre long, 0·60 metre deep, 0·60 metre wide at top, and 0·40 metre at bottom. The wheels are fixed to the axles, and these are generally very far apart, in some collieries as much as 27 inches.

2. Hornu and Wasmes, near St. Ghislain, on the Mons and Valenciennes line. The consession of this colliery is on the old system, or *par couche*, having been originally given by the abbots of St. Ghislain. It comprises six pits; of these, however, there are but two actually at work. Two are permanently abandoned (Nos. 1 and 2), one is temporarily laid off for re-arrangement of the workings (No. 7), and another (No. 4) is being thoroughly overhauled, and is receiving the addition of all the modern improvements. The shaft is being guided; large pullies, 11 ft. 9 in. in diameter, of the best construction for flat ropes, are mounted on solid traverses, about 20 in. by 20 in., built into the walls of the massive new building erected over the pit, which traverses in consolidated by iron rods and ties built in with the masonry; heavy machinery, calculated to work at a depth of 1000 metres (their lowest seam at this pit lying at that depth) is already up, and screens, sloped to an angle of at least 18° (at 10° the coal commences to slide), adapted to produce all descriptions of coal, are shortly to be put up. They expect to extract 4000 hectolitres, or over 350 tons, per diem from this pit. I went down No. 6 pit; depth 217 metres, section at surface about 2 yards square. I inspected below the workings in the *petite veine à Laune*, lying at an inclination of 22°, 0·70 metres thick, separated in two by a band of earthy matter about 2 in. thick. The coal is of the nature called *demi gras*. The distance between the levels is here from 40 to 60 yards. The working faces are about 14 yards wide, and will accommodate from six to seven hewers each. The rolley-ways running up to the faces are oblique, in order to lessen the inclination, the rule being that it shall not exceed 8° to 10°, this being considered the maximum that admits of convenient putting. They hew the coal in the following manner:—When the middle band is soft and earthy it is first carved out, and the upper part of the seam cut down. The lower part is then taken out by picks or levers. In some parts the band becomes hard and stoney, in which case the under coal is first attacked by being corved from beneath. (The Belgian seams are generally too small to render "nicking" necessary.) The stone band is then removed, props being inserted to sustain the upper seam of coal. When all is in readiness these props are withdrawn, and the coal comes down almost of itself. The band and the earth from under the lower part of the seam, when that is corved the first, are thrown by the hewer behind him and left in the pit. He would be punished if any were found in the tubs. There are here about 60 hewers, 40 putters, and 4 horses. I was informed that the hewers were getting 1·30 to 1·40 frs. per square metre, and thus earning 3·50 to 4 frs. a-day. The putters were getting 34 frs. per 100 tubs. There is here, as elsewhere, a man called a *marquerer*, whose business is to measure and keep account of the square metres of advancement in each face. The amount due is then paid every Saturday to the entire face, and the me

divide it among themselves, which system creates misunderstandings every pay-day among the men; this is, however, the regular method of the district. The shifts are arranged as follows:—The first shift goes down by the ladders at 3 A.M., and comes up at 3 P.M. by the cage. The men will do about ten hours' work in this shift. The second, which goes down when the first has come up, and is raised at 10 P.M., performs the duty of heightening the gallieries, laying the plates up to the faces, &c. The third shift goes down at about 5 P.M. to remove the dirt, stones, &c., and build up the works, coming out when this labour is accomplished. The output is but about 180 tons per diem.

The ventilation here, as elsewhere in the district, is obtained by means of machinery. Each pit is furnished with two machines, which work alternately two weeks at a time. At pit No. 3 they have a "Fabry" and a *ventilateur à ailes pleines*. They are considered to perform equally well. Each is worked by a machine of 10 to 12-horse power, which gives them, I was informed, from 12 to 15 cubic metres per second. They have houses built for their workmen on very intelligent principles. Each house is two stories high, and contains four rooms, two cellars, and a garret. The entire house is let for 2 frs., or about 1s. 8d. per week. They are of brick, the walls being 14 in. thick. The floors (tiled) are supported upon iron beams about 2 ft. apart, bricked between, the bricks being laid in such a manner as to form an arch. The cellar is 2 metres high, furnished with a drain. The roofs are single, formed by letting strong horizontal timbers into the gable ends of the brick walls, on which timbers is nailed the necessary frame-work to support the earthen tiles constituting the covering. They are built in double rows of 13 houses each, the rows being about, I should judge, 20 to 25 yards apart. This interval is divided up into gardens for one row of 13, the opposite row having *its* gardens on the other side, so that a line of houses intervenes between the two sets of gardens; in fact, everything that the rather unfavourable circumstances of the case will admit of seems to be done to ensure as much privacy as possible to at least each row of houses. Each house has its separate *lieu d'aisance*, with pig-stye attached, and every 13 houses have an oven. Water pumped from the "level," or *marnes*, is furnished gratis by the company, at a cost of perhaps 1 fr. per day. The faucet for the water is introduced in the same building as the oven. Every 13th house (or 26th, I forget which) is a *cabaret*, or beer-house. There are also bowling allies, &c., for the amusement of the men. Each row of 26 houses, with dependencies complete, costs upwards of 50,000 frs., though the company made all its own bricks, mortar, &c. They manufacture gas on the premises for their own use, but have not introduced it into the men's houses.

3. Bois de Boussu, near Boussu, on the Mons and Valenciennes line. This concession, of about 2785 acres, has five pits, but they are never all working at once. One has been laid off for a long time, and there are scarcely ever more than two working "up to the notch." The coal (*demi gras*) is much sought after in France and Belgium for sugar refineries. At the time of my visit there was only one pit (La Vedette) in activity, which was down 436 metres to the Houbard seam, about 32 in. thick. The output was about 3500 hectolitres, or (say) 300 tons per day. About 600 hands in all were employed. The workings are of the same class here as at Hornu and Wasmes, the coal lying in both cases *en plateau*, but under a steep inclination. There is, however, an important and typical point of difference connected with the laying out of the colliery, which is that the coal, instead of being worked to the rise or dip, is attacked to the right and left of the inclination, the rolley-ways running up to the working faces being a series of levels at right angles, consequently to the inclined planes by which the produce of the mine is transported to the pit bottom. The reasons for pursuing this method are—1. The inclination of the seam being very steep (20°), the putting is facilitated.—2. As there are many faults running east and west at right angles to the seam, which dips from north to south, they would have, if working in the ordinary method, all their working faces at a given moment in the stone, and no coal coming out until the impediment was cut through.—3. Their hewers being unaccustomed to work the coal differently, did not produce such large coal when, on one occasion, they endeavoured to change the system, besides which, it cost them 20 centimes more per square metre than by their old way, to which they were forced to return. In fact, it would appear that the coal must be cut more in accordance with its cleat by working in this manner. The coal is corved at the bottom about a yard in, for a height of about 6 in., the men using light double-headed picks, with tempered points and long handles. The coal, having been corved, is cut down with heavy single-headed picks. All the fine is taken up; a hewer detected in leaving any behind him would be fined. On the short length inclines, where the tubs are put by hand, they use, as usual, wooden rails. The putters draw the tubs by means of a strap around their shoulders, attached to a cord passing between their legs. At the pit bottom there are two different levels connected by an incline for removing two tubs into the cage simultaneously. The cages, containing, as usual, four tubs, are provided with Fontaine's parachute, which appears to be much used in the district. The skates are very heavy, 4 in. by 8½ in., and the traverses to which they are bolted are about 2½ yards apart. The machine is a double horizontal cylinder one—150-horse power, provided, as is very generally the case here, with a steam-break. A loaded cage is drawn up in about one minute. In addition to the bell-signal, announcing the approach of the cage to the surface, there are two bunches of straw fastened to the rope, near the cage. As soon as these come in sight, the banksman hails the breaksman to apprise him of the fact. They use a ventilating machine, giving about 12 cubic metres of air per second. As an illustration of the fluctuation of prices, I may mention the fact that the hewers are now getting but 55 to 60 centimes per square metre, labour being abundant, while formerly they received 80 centimes. Under very favourable circumstance, I was told a man might hew his 15 four-hectolitre tubs—a little more than 105 cwts. in a day.

4. Bellevue, near Thulin, Mons and Valenciennes line. This is a very extensive colliery, worked by four pits, each of which is entirely separate and distinct from the others. They employ in all, and including the coke oven gangs, some 900 hands, about one-eighth of which are females. The years of these latter decide the nature of the work confided to them. Below ground, girls of from 10 to 15 years of age are employed to *remblayer* or build up the excavations; those of from 15 to 20 load the tubs at the working faces; and at day time females are also employed to take the tubs out of the cages, pick over the coal, &c. At the pit I descended, No. 7, they were working at a depth of 392 metres, but the pit is, in reality, down 10 metres lower, to a new stone drift, which they are engaged in driving. Like most of the Mons pits, its interior diameter is about 3 metres, and bricked, with the exception of about 10 yards, which is walled with a wooden tubbing. (Most of the Belgian tubbing being old is of wood.) The seam at this point is an example of *dressant* workings; lying very steep, in somes places almost perpendicular. I did not note it at the time, but, if my memory does not deceive me, the thickness of the coal is about 27 inches. It is very curious to see such a seam, worked up, perfectly or nearly, perpendicularly. As I have already mentioned, the system of working remains in principle identically the same as when the coal lies flat. The working faces are caculated to accommodate only one hewer each, and are arranged in a series of steps, or *gradins*, as they are called, the men climbing up the *remblayage*, and cutting out the coal as best they may, working up as high as they can reach in their shift. I have already mentioned the "chimnies" that are used to replace the rolley ways usually run up to the working faces. They are long passages worked through the *remblayage*, through which the coal is thrown as it is hewn down to the level below. From this level it is again pitched through a similar chimney, placed as nearly as possible under the first down to the next lower level, and so on till the coal reaches the main level, when it is loaded into tubs, and "put" to the pit bottom. Where the seam is not so very steep oblique rolley ways are run up as usual. I noticed that where the coal lies steepest they usually "nick" the upper or roof side of the coal (from the almost vertical position of the seam it can scarcely be called corving). The reason they allege for so doing is, that the coal is softer there than at the floor, and that they can more easily get rid of the dirt produced before taking down the coal. Here, as elsewhere, the hewers work in their shirt sleeves. At the time of my visit very little was doing at this pit; the output was only of about 40 tons, and but about 60 hands (say 20 hewers) and two horses employed. Hewers were getting 75 centimes per square metre, and putters 20 francs per 100 tubs.

E. Sherman Gould, C.E.

Heidelberg.

Coals Classified.—At the Polytechnic Association of New York, Dr. Stevens said:—"Practically, the following has come to be a division of coal into several kinds or grades—Coals without or with but little flaming qualities, or containing but little bitumen, are called anthracite. Coals emitting a flame for a short period, a semi-anthracite, containing 78 per cent. of carbon, and 13 per cent. of bitumen. Coals containing 50 per cent. of carbon or more, and 40 per cent. or more of bitumen, with 50 or 60 per cent. of ash, bituminous coal. Coal containing a smaller per cent. of carbon than bitumen, a cannel coal, and if a sample resembling cannel contains more than 40 per cent. of ash, it is called bituminous shale or shist. A still further division of the cannel could be made with a clearer conception of the great subject. All those cannels containing a very small per cent. of ash, (say) 2 or 3 per cent., and 85 or 90 per cent. of bitumen, we should call fossil bitumen, and among these we should class the famous boghead of Scotland and Albert coals of New Brunswick."—*United States Railroad and Mining Register.*

GREAT TYWARNHAILE MINING COMPANY.

The annual meeting of shareholders was held at the company's offices, Temple, on Tuesday,—The Right Hon. the Earl of Shrewsbury and Talbot in the chair.

Mr. J. H. Mackenzie (the secretary) having read the notice convening the meeting the report of the directors and of the managing captain, and the statement of accounts to Sept. 30, of which the subjoined is an abstract, were read:—

The directors have much pleasure in stating that the mine is forked to the 90, where another plunger-pole is now being fixed, and they hope shortly to reach the 100. The present pumping-engine has done its work very well, but in order to relieve the great strain on it, and more successfully fork the other parts of the mine, and also to prevent the great damage and delay that must ensue in case of an accident, they have deemed it advisable to carry out the original recommendation of Capt. Hampton, to fix a second pumping-engine, and after much enquiry and consideration they have determined to place one over John's shaft, to drain that part of the mine which the present pumping-engine could not properly do. They have, fortunately, been able to purchase a very good second-hand one on reasonable terms, and the new engine-house is now nearly complete. The engine is being fixed, and the pump-work and pitwork at John's shaft are being prepared, and the whole will be complete and at work early in the ensuing year. Both the crusher and the whim-engines have been and are now in full operation, and doing their work well, but from the large quantities of ore that are being developed the board are advised that a second whim-engine will very shortly be necessary to draw the ore to surface as fast as it can be extracted from the various levels underground. The pitwork has stood remarkably well. The report of the agents the board consider most satisfactory; and the results have fully realised the expectations anticipated by the manager, Capt. James Hampton, and others. Regular monthly sales are now made. The total amount of ores sold since the commencement of operations has been 2364 tons 18 cwts. 1 qr., realising the sum of 8468*l.* 8s. 10d., the average price per ton being 4*l.* 2s. 3d., which, considering that the mine has only been two years in operation, and the rich and extensive lodes now opened having not been yet worked, is believed to be almost unprecedented. The manager states confidently he will be able to raise 400 tons a month by March, for the sampling on the second Tuesday in April, and gradually increasing the quantity as the mine is laid open. The lodes in the 80 and 90 are proving most valuable, and with a view of working them to the best advantage the board have authorised an extension of tutwork operations, in addition to the work done by the tributers. In the present easy state of the money market, the directors have considered it desirable to anticipate the sale of ores by a loan from the bankers in preference to making a further call, but at the general meeting it will be for the shareholders to decide whether it is not more desirable to raise further capital in addition to the 6000*l.* yet uncalled of the present capital, and in what manner such additional sum shall be raised.

The board have appointed Capt. John Daw, in the room of Capt. John Edwards, who resigned on obtaining a good appointment abroad; and they have arranged during the last year for Capt. J. Hampton to reside at Truro, and give a larger portion of his time and attention to the work and affairs of the company, by which the board believe the company is and will be very materially benefited. In accordance with the Articles of Association, the directors propose a vote at the annual meeting for making an allowance to directors and auditors. Messrs. F. J. Partridge, and A. Keith Falconer, retire by rotation, but are eligible for re-election, as also are the auditors.

Nov. 16.—The 90 being dry, we are putting in a plunger lift at that level with all possible speed, which we hope will go to work by or about the end of this month. The pitwork throughout is working satisfactorily, and every precaution is taken, and attention paid, by having men constantly in the shaft, who are superintended at uncertain intervals by the captains to keep the men at their duty, and to watch the machinery narrowly to prevent delay in pumping as much as possible. The other engines and machinery are at present in a most efficient state of working. At John's shaft the engine-house is up and being covered in, and the engine is being prepared to be put together. We have finished cutting down the shaft to the 70 from surface, and by the end of this month we expect to have the shaft cleared of stuff, and cistern-plats cut, that the pitwork may be fixed forthwith, and the new pumping-engine set to work as soon as possible, that the shaft may be drained to bottom to make this part of the mine available for extensive operations, it being in one of the best localities in the mine, although the water is drained to the 90 at Gardiner's shaft. John's shaft is full to the 70, and a large stream running from that level to the present pumping-engine, which the new engine will have to draw, in addition to the water falling from the upper levels in the eastern part of the mine, which can be conveyed back in the 60 to St. John's shaft through wood pipes or launders, by having a short lift at Gardiner's to lift it up from the 70, in this shaft, where the water is coming out. This latter, however, may not be necessary; but if is, it can be quickly done, and the whole water in the mine would be so divided that both pumping-engines might work with ease and comfort until both engine-shafts are sunk to one level, and communications made therefrom at each respective point, to enable the water to flow spontaneously to each engine, without the aid of machinery or any other means. But in taking no credit for the increased facilities we shall have afforded us by the second pumping-engine, the water can and will be kept at a less cost than by having one pumping-engine only at work, even supposing one engine could do it; and this will be apparent when you are told that there will be less wear and tear in two shafts than we now have in one, consequently, less hindrance, and less liability to accident, and the consumption of fuel will not be more, if so much. By having two engines the fires, which are now forced on to keep up a sufficient steam to keep the engine generally working to its full speed, will burn at leisure, and economy in coal must be the result. I, therefore, express myself openly that the decision of the directors to erect the second pumping-engine was most wise, and it will prove the salvation of this mining property, which (at the present standard of copper ore) is one of the best in the county. Soon after John's engine goes to work, another whim or winding-machine will be necessary and indispensable to progress; as it will be impossible to draw to surface by the present single whim-engine all the ore we shall then be in a position to raise. I presume this will cost from 1000*l.* to 1200*l.*, but much depends on whether a new or second-hand engine is bought. We have completed the skip-roads to the 90, at Bennett's and Railway shafts, and in the 80, at James's shaft, and are now in a position to draw from these levels respectively. The 90 east is in a great lode, and producing at least 25*l.* worth of ore per fm. from the end, whilst the ground is standing whole in the back and bottom of the level. I may state further, that this course of ore is, doubtless, cut in the 100, as there is a similar good lode in that level at the eastern whim-shaft. In the 80 west we have been stopping the bottom of the level to let down the water, but we are now nearly in a position to drive that end west towards John's shaft, it being our principal object to effect a communication speedily, and to lay open most valuable ground in this direction, where we know it exists. In the 70 east we are driving on Taylor's lode; the end is saved for ore, and we anticipate an improvement shortly. The same remark applies to the 60 east, except it may be a little more valuable at present. We have driven a cross-cut in the 40, and intersected Taylor's lode, which is valuable, and when more laid open will let at a moderate tribute, and leave a good profit in working. I presume I need not go into minutiæ as to how the various tutwork operations are to be carried on in future; but the shafts must be sunk, levels driven, as also cross-cuts and winzes sunk to cut out the mine in sections, for the cheapest mode of working it; and the directors will be in possession of the agents' reports, and their recommendations from time to time as the mine progresses. We sell 325 tons of ore on the 28th inst., one month's produce, and the sampling for March next is not likely to be less than 400 tons, and that quantity will gradually increase as the mine is developed; and in all probability the time is not far distant when we shall be sampling 600 tons per month, and at a much greater average price per ton, as most of the best places are still unworked; and at those places where good lodes exist, and are dry, comparatively little has yet been done, because we have not had the opportunity. The directors may rest assured that their agents have their interest at heart, and they will do the best of their ability to bring about a speedy and prosperous issue.—J. Hampton.

Dr.—Received on capital account		£21,124	11	6			
Debts and liabilities		5,396	2	6			
Loan from bankers		4,000	0	0			
Sept. cost unpaid		892	4	6	= £31,412	18	6
Cr.—Cost of lease and plant		£28,860	15	9			
Ore in stock		885	0	0			
Debts owing to company		1,586	5	2			
Cash at bankers		80	17	7	= £31,412	18	6

The Secretary explained that these accounts were drawn up in accordance with the requirements of the Joint Stock Companies Acts; but in order that the shareholders might readily understand their actual present requirements, he had prepared another statement for their guidance. The company are indebted to the bankers 4000*l.*; to other creditors, 5396*l.*; and for the September cost, which remained unpaid, 892*l.*; making together, 10,288*l.* Against this they had assets, consisting of ores raised, 885*l.*; and good debts due to the company, 1586*l.*; making together 2471*l.* This left 7817*l.* actually due from the company; and to this they must add 3000*l.*, estimated for further liabilities, and 1500*l.*, which was estimated as the maximum further outlay to fully develope the mine, raising their total present requirements in round numbers to rather more than 12,000*l.* To meet this they had 6000*l.* of capital remaining to be called up, leaving 6000*l.*; this would have to be raised in some way—for instance, by calling up the remainder of the capital by borrowing the money on mortgage, or by the issue of preference shares; and it would be for the meeting to decide which course was most desirable to adopt. In reply to Mr. Nicholls, he stated that all calls were paid up, with the exception of about 200*l.*, chiefly from persons with whom they were dealing.

The report and accounts were then unanimously received and adopted; the auditors and directors retiring by rotation were re-elected; the sum of 150*l.* per annum was voted to the directors for their services; and, with regard to the auditors, it was resolved that in future the remuneration be 15*l.* 15s. per annum to the professional auditor, and 5*l.* 5s. to the shareholders' auditor.

Mr. Nicholls thought they might now proceed with, perhaps, the most important part of the meeting—the question of the raising of additional funds. He had lately visited the mine, and was thoroughly convinced it would pay handsome and continuous dividends; the prospects were very good, and he congratulated the shareholders on possessing such a good investment. He had no doubt the new shares would be largely taken up.

General Hay said that he had given the subject careful consideration, and would advise the borrowing of 12,000*l.* upon mortgage. They had at the present time 325 tons of ore sampled, and that the price was good and the standard high. The ore they had already sold realised something over 4*l.* per ton; but, taking it at 4*l.*, its value would be 1300*l.*, which should leave a profit of 400*l.*; to provide, however, for every possible contingency, they would say 300*l.* This was upon a single month's working, and, judging from Capt. Hampton's report they might fairly estimate that this would be below rather than above the average. Consequently they might calculate upon 3600*l.* per annum becoming available for dividend. He would propose to appropriate these profits thus—They had 24,000*l.* of capital on which dividends would be due; 10 per cent. upon this would absorb 2400*l.*, leaving 1200*l.* to pay interest on money borrowed. He believed the original shareholders would be satisfied with 10 per cent. per annum until sufficient time had elapsed to redeem the preference shares, provided they knew that the mine was going on well. With regard to the balance of profits, it would be easy to apply it to the borrowing of 12,000*l.* upon such securities as it was deemed advisable to offer. He did not think any shareholder would like to raise the amount by the issue of additional original shares, as by such a course gentlemen unconnected with the company during the unprofitable period of its existence would be allowed to come in and participate with themselves, and all future profits would be distributable upon a capital of 42,000*l.*, instead of upon 30,000*l.* He did not like preference shares, as the issuing of them would be the means of bringing in too many shareholders. To make preference shares valuable they must bear an interest of at least 6 per cent., and to clear them off they would have to pay a bonus. If the money were obtained by mortgage, they could gradually reduce it by the establishment of a sinking fund; he would, therefore, prefer to call up the 6000*l.*, and to borrow the reaining 6000*l.*

The Chairman thought it would be better to borrow the whole 12,000, as that would leave the 6000*l.*, which secured their credit, still available.—The Secretary quite agreed with his lordship, more especially as many took shares thinking that not more than 3*l.* per share would be required. It would, moreover, be very inconvenient, in the event of their requiring accommodation at any time, to obtain it if the whole of their capital had been called up.

Mr. West expressed the opinion that the issue of irredeemable preference shares would be the best mode of raising the amount required. Irredeemable would be more valuable than redeemable preferable shares, and he thought the use of the money so raised would always be worth the 6 or 7 per cent. which they would have to pay for it.

General Hay remarked that if they borrowed 12,000*l.* on mortgage they would have the 6000*l.* to offer as security as well as the mine.

The Secretary explained that, unless they included the uncalled capital in the mortgage, they could only mortgage the chattels, which were but a third or fourth-rate security; indeed, he believed it would be impossible to raise 12,000*l.* on mortgage.

The Chairman said there was another way of obtaining the money—by negociation with the bankers.

The Secretary explained that that involved a personal guarantee, which some of the directors were unwilling again to undertake. They must remember that the present crisis was hastened because they were reminded by the Union Bank that the money was only lent for six or eight months. They could not hope to obtain a permanent loan from the bankers.

The Chairman thought they might expedite business by formally agreeing as to what they had decided not to do. They had decided that it was unadvisable to call up the remainder of the original capital (agreed to). They had decided that it was unadvisable to attempt to raise the money upon mortgage (agreed to). They had decided that the amount could not be raised by negociation with the bankers (agreed to). This reduced them to one resource—to raise the amount by the issue of preference shares; it became, therefore, the business of the meeting to decide how those preference shares were to be issued. He would recommend the amount raised to be 13,000*l.*, so as to leave them a margin, and that the mode of issue be arranged by a committee to be now appointed.

The Secretary suggested 10,000*l.* would be ample to raise, and, after some further discussion, it was resolved that the capital of the company should be increased by that amount by the issue of preference shares, the number and amount of such shares to be left to the discretion of the directors.

Mr. West remarked that in exercising that discretion the directors should bear in mind the interest of the preference shareholders as well as of the original ones.

Mr. Partridge, General Hay, and Mr. Seale Hayne were then appointed a committee to prepare a scheme with regard to the preference shares, such scheme to be presented to the board at their next meeting.

Mr. Nicholls then moved, and it was carried by acclamation, that the thanks of the meeting be tendered to the Right Hon. the Earl of Shrewsbury and Talbot, for his able conduct in the chair, which having been acknowledged, the meeting separated.

ON THE INTERNAL HEAT OF THE EARTH.

TO THE EDITOR OF THE MINING JOURNAL.

Sir,—The letter of Mr. Evan Hopkins, C.E., F.G.S., which appeared in the *Mining Journal* of Nov. 9, demands, in support of truth, a few remarks in vindication of the theory of the increase of temperature from near the earth's circumference to its centre; and which, to my mind, can be made as demonstrably clear as that of the square of the hypothenuse of any right-angled plane triangle is equal to the sum of the squares of the base and perpendicular. Mr. Hopkins says:—"Many eminent geologists, in England as well as on the Continent, are beginning to doubt the existence of internal fire, and question the correctness of the data on which the assumption of intense heat has been founded." However eminent these may be as geologists, they are certainly very indifferent philosophers. Nor does Sir Roderick Murchison, whom Mr. Hopkins quotes, deny the existence of a central heat; for the quotation from him, embodied in Mr. Hopkins's letter of Nov. 4, not only shows that Sir Roderick Murchison believes in a central heat, but that, in his opinion, a central heat cannot be denied.

I think if those who deny a gradual increase of temperature from near the earth's surface to its centre were to consult Mr. Joule's different papers on the production of heat by force they would be inclined to alter their opinions. Many phenomena can be adduced to prove that heat is produced by force in various ways. For instance, strike a bar of metal with a hammer, and heat will be produced in proportion to the force of the blow; friction, pressure, gravitation, &c., all produce heat as results, however applied. Why, then, should exceptions be raised against the general laws of Nature? That man must be perverse who dares to make them.

That the earth's heat increases in a decreasing ratio, but not without limit, from near the surface to the centre can, to my mind, be made demonstrably clear. I will take Mr. Hopkins's 2000 fms. from the surface to begin with, where he thinks the temperature from thence to the earth's centre probably becomes equable. To elucidate the subject more clearly, let us assume the earth's radius divided into a series of 4000 cubic miles. The pressure of the first cubic mile, near the surface, on the centre to produce a certain increment of heat at the centre; the pressures of the second, third, fourth, &c., cubic miles would evidently respectively be less and less (Cor. Prop. 91, Newton's Princip.), in a decreasing series to the centre, each cubic mile in the series producing increments of heat at the centre, less and less to the centre. The temperature for a considerable distance from the centre increases, therefore, very slowly towards the centre; hence the difference of temperature from the centre necessarily increases more and more towards the circumference, in the ratio of the increase of gravity in the same direction; hence, also, it is manifest that the heating and gravitating forces act in opposite directions, the one producing the other, being coequal and coexistent; the difference of temperature thus induced inducing the ethereal fluid (caloric) to assume its electrical functions,—negative and positive electricity in a regular series from the centre towards the circumference. The same general law of thermo-electrical action evidently holds good with regard to all the heavenly bodies. The earth's surface thermo-magneto-electrical currents, induced by difference of temperature, beautifully illustrates the general law. The same general law holds good as regards thunder and rain-storms, whose centres have invariably a higher temperature than their circumferences. If one of these were passing over one of the magnetic poles, at or near right angles to the magnetic meridian of any place, it would tell upon the magnetic instruments of such place as faithfully as an electric telegraphic message sent from place to another. The magnetic needle would be deflected first to one side of the magnetic meridian, and as soon as the centre of the storm had crossed the magnetic pole the needle would in a few minutes be deflected to the opposite side of the magnetic meridian. This rapid motion of the magnetic needle from one side to the opposite side has been occasionally observed. The greater the area of the storm the greater would be the deflection, first to one side of the circumference of the storm (the point of lowest temperature), and then to the other side of the circumference. Mr. Hopkins seems to lay great stress, in support of his argument against an increase of heat towards the centre, on the fact that the temperature of the water of the oceans decreases from the surface downwards to about 39° at the greatest depths. This is playing into my hand; for this condition admits of a very natural and easy explanation, and does not, therefore, militate in the least against the earth's central heat. The cause of this phenomenon is evidently somewhat due to the slight compressibility of water at low temperatures, varying from 32° to 39°, but more especially to the ice and snow-waters of mountains and of the polar regions. The specific gravity of such waters is greater than of waters of a higher temperature, and, therefore, naturally sink to the bottom of the ocean, and are induced, by the earth's rotation on its axis, to flow in currents from the polar towards the equatorial regions. These subaqueous currents admit of an easy explanation on mechanical principles, which would be taking up too much space to elucidate. Then, again, with respect to the low temperature in some deep mines, I need only remark that metallic mining operations are generally carried on in mountainous districts, whose substratum is fissured rock, which readily admits the ice and snow-waters of the mountain tops and sides to percolate to considerable depths, and, therefore, to keep the subterranean temperature down to a low degree. I know of a large surface spring of very cold water, which is about ten miles from the nearest mountain,—Benbuiben, in the county of Sligo,—whose water is doubtless drained from the mountain tops and sides. Besides, we ought not to lose sight of the earth's magnetic surface currents, induced by difference of temperature, in causing, perhaps, considerable irregularities in the temperature of subterranean deposits. Beyond these influences, the earth's heat must increase in a decreasing ratio to the centre, but not without limit. It is very natural that the temperature of the deepest waters of the oceans does not fall below 38°; I should, indeed, have been surprised if Mr. Hopkins could have shown that they had been found as low as 30°.

Furthermore, Mr. Hopkins says, in speaking of the source of heat of the animal body,—"The flesh is kept warm by the circulation of the blood, but there is no fire in the body." Strange remark, and that, too, from a C.E., F.G.S. Now, the heat of the body is not maintained, except in a very minor degree, by the circulation of the blood; it is kept warm by the condensation of oxygen in the gaseous state in the lungs into the liquid state in the blood, analogous to the condensation of the oxygen of the atmosphere and the hydrogen of our gas-lamps into water. The caloric of both gases is forced outwards in the act of condensation, by reason of the great difference in their specific heats under the influence of increments of heat, thus giving rise to both light and heat. But in the lung-bearing animals the heat is principally derived from the mutual chemical action of the carbon of the blood and the oxygen of the air we breathe, in their passage into the lungs. The cause of the production of heat is precisely analogous to that of the gas-lamp. It is clearly this difference of temperature of different bodies, whose specific heats vary considerably while under the influence of increments of temperature, that causes them to chemically combine. It is this difference of temperature between the centres and circumferences of the different heavenly bodies which causes them to retain their globular form. If the temperature below 2000 fms. from the earth's surface to its centre, as assumed by Mr. Hopkins, were equable, the repulsive force alone would exist, and the attractive force of gravitation cease to play its important functions. Animal life would also cease if the temperature of the body throughout all its parts were the same. But this is known not to be the case; for it is well known that the temperature of the arterial blood near the heart is two or three degress higher than the venous blood about the surface. Vegetable life is analogous to animal life. On dry or properly drained land the heat decreases from the surface to a certain depth,—*i. e.*, under favourable growing sunny weather, thus developing the roots of vegetables by the induced combining action of positive and negative electricity, brought into play by difference of temperature. Then, again, for the healthy and rapid growth of vegetables the atmosphere should be sunny but cool. The temperature under such conditions would obviously decrease from the surface upwards, and thus induce the necessary negative and positive electrical action for the development of the leaves, buds, stems, &c., of vegetables; indeed, I have long observed that the atmosphere ought to be cooler than the ground on that of the developing parts of vegetables, otherwise the vegetables become blighted and cease to grow. This is beginning to be observed and acknowledged. The theory of vegetable life ought to be well known amongst agriculturalists, for then good deep drainage of wet lands, if practicable, would not long remain in abeyance.

Wm. Steevenson.

The Telegraph to India.—A few weeks since we referred to the formation of a new company for completing important work commenced by the Red Sea and India Telegraph Company, and more recently a special general meeting of this latter company has been held for the purpose of considering the proposal received by the board from the Lords Commissioners of the Treasury for the transfer of the line and property of the company to Her Majesty's Government; the result of the deliberations being that a resolution was unanimously passed empowering the directors to take the necessary steps for carrying the arrangement into effect. The Telegraph to India Company has by this resolution been placed in a most satisfactory position, and we cordially agree with Sir Macdonald Stephenson in his remarks upon the prospects of the undertaking. His observations were the more interesting, as the carrying out of the new company was one, and an essential, condition in the Government arrangement. Telegraphic communication, he said, between Great Britain and her vast dependencies in the East had long been an acknowledged and imperative necessity, and corresponding exertions had from time to time been made to accomplish it. Immediate success rarely attended any great innovating enterprise. It was a gradual and progressive operation, attained only after repeated failures had furnished the experience upon which ultimate success could be hoped for. The greater the undertaking the greater the difficulties usually encountered, and the greater should be the resolution and perseverance exercised to overcome them. This was no new theory; it was the thought,

language, and action of every Englishman under the same circumstances. It must only be the right thing to be done, and neither time, trouble, nor money would be spared to accomplish it. The Telegraph to India would not require any illustration to demonstrate its value to all classes. Additional lines would assuredly be required within a few months of the restoration of the first. One merchant assured him that he should have saved 50,000*l.* if he could have sent a single message. The Peninsular and Oriental Company's reports of their ships where of hourly necessity. The use of the telegraph was universally admitted, and it was to its completion that their attention was now needed. The false position in which the old company was placed by the late Attorney-General had nearly destroyed the prospects of telegraphic communication with the East for, perhaps, years to come, but for the earnest and active interference of those who had exerted themselves so effectually to remove the erroneous impression of the insuperable difficulties in the way, and to show that by the adoption of proper means and precautions the communication might be restored, while the parties who embarked in the new enterprise were secured the alternative of a very high rate of dividend if successful, or the reimbursement of their outlay in case of failure. The liberal terms conceded by the Government had effected this, and the argument on which it is based and explained was unanswerable. If the undertaking were successful the Government would get back their advances; if unsuccessful they would know that every exertion had been made to secure success, and that after the repayment of their outlay to the shareholders the balance from the sale of the property would go to the Government.

A New American Gas Coal.—It has been lately discovered that a coal mine, situated on Cape Breton Island, contained coal of a superior quality for gas-making, surpassing every American coal in this respect, with but one or two exceptions. The mine is situated upon Cow Bay, now called Manhattan Bay, in honour of the Manhattan Gas Company, of this city, who have just contracted for 20,000 tons of the coal. This mine seems to have been worked at some former period, probably before the country fell into the possession of the English. It is now under the supervision of Marshal Bourinot and Robert Belloni. An analysis of the coal, by Dr. Torrey, gave the following result:—

Water	5·00
Volatile combustible matter	33·80
Fixed carbon	55·80
Ash (dark red)	5·40=100·00

One ton of 2240 lbs. produces 9600 cubic feet of gas and 40 bushels of coke; weight of coke, 1416 lbs. The coke is clear, of good size, and free from breeze. It burns well, and makes a hard clinker. When the production of gas is confined to 9500 ft., the analysis is—

Olefiant gas	5·25
Hydro-carbon vapours	·75
Carbonic oxide	9·25

Tested by the photometer, 5 cubic feet of this gas is equal to 17·98 standard sperm candles, burning at the rate of 120 grains per hour. After standing over night, the gas had an illuminating power of 17·53 candles.—*American Gas-Light Journal.*

Victor Emanuel.—Miggiandone, Nov. 14: The end of Falconer's level contains a very promising lode, composed of gneiss, iron pyrites, and good stones of copper ore. The stopes in the same level are worth at present 1½ ton of good ore per fm. We are breaking some good ore in Fussell's level also, where the lode is improved. All other points are without any important change. We sampled last week about 18 tons of stamps' work.—Baveno: The draining and re-timbering of the old shaft is going on steadily, and will be prosecuted hereafter more energetically, the Cornish miners having arrived. We are finding more arches of the lode left by the old men, containing very rich ore: a good deal of ore could be broken from them, but we think it of greater importance to employ all our forces in getting to the bottom of the mine.

St. John del Rey Mining Company (Limited).—Advices from Brazil:

Morro Velho, Sept. 28.—Mine.—Although this is the season for the preparation and planting of their grounds amongst the Brazilians, and the time when many absent themselves for that purpose, still we have a good attendance of natives, and, on the whole, a good and sufficient mine force. A very good supply of stone is now received from the mines, affording a little stock on the spalling-floors, which is advantageous to the spallers, and desirable for the proper selection and treatment of the ore.

Gold Extracted to Date.—The stamps' produce for the second division of Sept., being a period of nine days, is as follows:—

	Oits.		Tons stone.	Oits. p. ton.	
From General stamps	8198	..from	1112·8 =	7·366	7·414
,, Herring (East Bahu)	2603	.....	307·2 =	8·473	
,, Lyon (West and Mid. Cachoeira)	1916	.....	295·2 =	6·490	
Total stamps' produce	12,717		1715·2		

The foregoing return is 8·3 oitavas or about 9 oitavas per diem less than was obtained during the first division of the month. The produce from the Middle and West Cachoeira is not so good, and that from the general stamps is better. The difference in the general standard return being 0·118 oitavas, or little more than one-tenth of an oitava per ton in favour of the first division's work. The return is good so far this month, and the standard yield above the usual average. By the gold troop, which left Morro Velho on Sept. 26, the two months' produce to Sept. 18 is forwarded: it is in 20 boxes, containing 92,723 oitavas = 890·796 lbs. troy.—N.B. The gold arrived with the above advices.

Oct. 19.—Produce.—The produce for the month of Sept. amounts to 46,443 oits., being the largest month's return of gold yet extracted. It has been derived as follows—

	Oits.		Tons stone.	Oits. p. ton.	
From General stamps	27,707	..from	3764·8 =	7·359	7·601
,, Herring (East Bahu)	8,056	.....	873·6 =	9·221	
,, Lyon (Mid. and West Cachoeira)	6,727	.....	951·2 =	7·072	
Total	42,490		5589·6		
Arrastre produce	1,720			= 0·308	
	44,210			= 7·909	
Praia produce	2,205				
Recovered from sweepings of gold melting room	28				
Total	46,443 oitavas.				

It will be seen from the foregoing return that the East Bahu ore has given the large yield of 9·221 oits. per ton. The standard yield from the ore treated in the general stamps is also the largest average monthly return yet obtained. The total produce gives a daily average of 1548 oitavas.

Cost and Profit.—Produce for Sept. is .. 46,443 oits.
Less loss in melting ..... 248 oits.

Leaving	46,195 oits., at 7s. 7d. per oit.	£17,515 12 1
The cost for Sept. is Rs. 92,265 $347, exchange 2s. 0¼d.		9,322 13 1
Thereby leaving a profit of		£ 8,192 19 0

The cost is nearly four contos of reis more than that incurred in Aug.; but under the more favourable rate of exchange, and a little increase in the produce, a good profit has been realised. Prices of provisions are rather lower than during the previous month, but the quantity consumed is larger, owing to the increased force acquired in the middle of the month of Sept. We have a good stock of provisions in store for the wet season, and, therefore, there is not at present much probability of increased prices under this head of expenditure. In providing our new pitwork and inclined plane for the Cachoeira, and in the outlay requisite for applying the wire-rope in lieu of chain, our expenditure will be heavy for some months. This however in the end, there is good reason to expect, will effect a saving in the working of the mines, and, therefore, will prove advantageous to the company.

Reduction Department.—Stamps working for 30 days, average 129·62 heads; ditto 135 heads, average 28·88 days. Arrastres working, each 23·52 days; produce per diem, 4·570 oits. Stamps produce per diem per head, 10·92 oits. The arrastres produce on that of stamps is 4·04 per cent. The quantity of sand amalgamated during the month amounted to 1968 cubic ft., which has yielded 22·46 oits. per cubic foot. The ore reduced amounted to 5589·6 tons, and the quantity of killas and unproductive stone rejected on the spalling floors has been 1687·2 tons. The quantity of ore reduced during Sept. is about 500 tons less than in Aug. This has been caused by the stoppage of the 12 heads of the Herring stamps for a period of 7½ days, from the breakage of the western axle, as previously advised, and also from the decrease in the supply of water usually experienced in the month of Sept. With the view of aiding the stamps in the reduction of the ore, the spalling was made finer than the usual guage, and three head skins at the Powles stamps were taken up every two instead of every four hours, in order to increase the recovery of the gold from these stamps.

Under the disadvantages stated above, it is most gratifying to be able to state that the produce has not been lessened, but rather increased, during the 30 days month of Sept. The general machinery throughout the department has been kept steadily at work, and the duty performed has been satisfactory.

Praia.—At these works the decreased supply of water is more felt than at the general works in Morro Velho. Notwithstanding the produce obtained is good, it has been derived as follows:—Stamps with cascalho and sand, 998 oits.; stamps with hard killas and quartz, 494 oits.; arrastres, second treatment of sand, 713 oits.: making a total produce of 2205 oits. When the diminished supply of water is taken into account, the foregoing produce for 30 days is very satisfactory. A small stock of Cascalho has been secured, by way of partially providing for the wet season, which may now be expected to commence daily. The produce of the arrastres per diem at these works is 4·020 oits., being only ·550 of an oitava less than extracted at Morro Velho, where the sand is received, and treated direct from the stamps.

Mine.—During the month of September there has been a good attendance of natives, giving a daily average of 343·04, of whom 241·48 were borers. The quantity of stone quarried and sent to the spalling-floors amounted to 8624 mine wagons, equal to 27·89 wagons per borer. This duty is not so large as we have had during some previous months; but the decrease may be partly accounted for by the number employed in driving eastward in the Bahu, with the view of aiding in getting down the western part of the Cachoeira more rapidly. In this latter the sump has been sunk 2 ft. vertically, and the stoping throughout carried on regularly. In the Bahu, as previously advised, our stoping operations are more concentrated on the eastern part. The sump has been sunk 18 in. The general timber-work throughout both mines, has received a fair amount of labour and attention, and some further progress has been made in laying the new inclined plane in the Cachoeira. A new plunger (No. 6) has been completed in the Bahu, and is at work. No change has taken place in the quality of the lode, and no noticeable movement in the walls has been observed during the past month. The supply of stone from the mines has been sufficient to afford ore for the stamps' consumption, and the quantity of killas quarried and sent to surface is less than during the two previous months.

West Quebra Panella.—The sump has been sunk 3 ft. 6 in. vertically, and at the western tram level 3 fathoms have been driven. The lode continues good, and presents a settled appearance.

Produce for 11 days, Oct..... 15,392 oitavas.

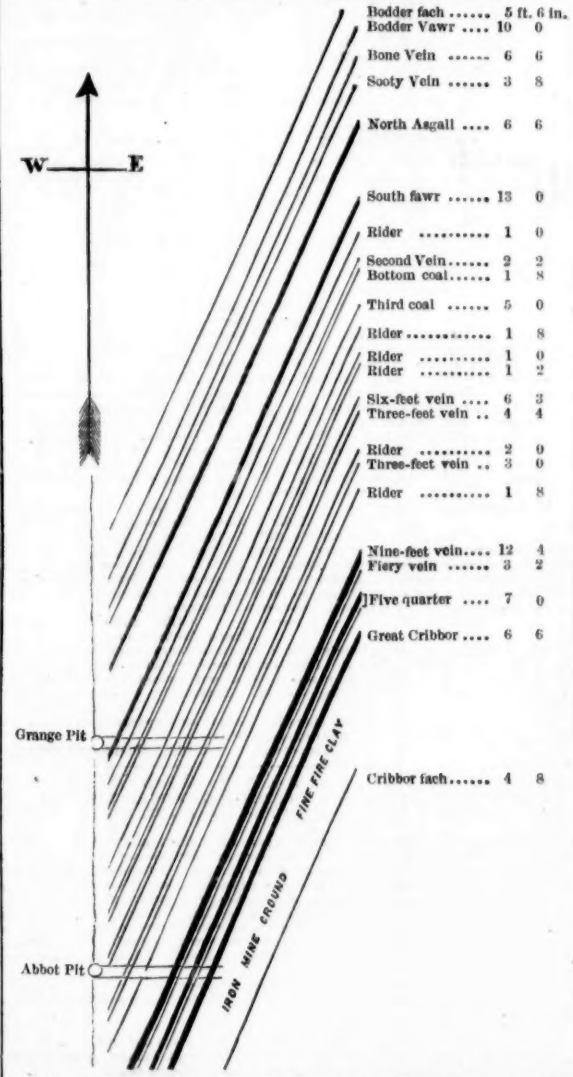
Steam-Engines and Boilers.—Some improvements in steam-engines and boilers have been proposed by Messrs. Spencer and Taylor, of Rochdale. The invention consists, firstly, in grate-bars in furnaces of steam-boilers. Where the fuel is surrounded with water they construct the said bars in the form of an arch, but should the water be above the furnace they reverse the said arch, by which method they gain greater heating surface, and thereby effect a greater saving of fuel, compared with the ordinary horizontal bars heretofore used. Another part of their invention relates to flues in steam-boilers, and consists in placing barriers of a circular or other suitable form in or near the centre of the flues, so that the heat may be better distributed on the surface of the plates; the barriers to consist of segments, so that they can be removed for cleaning the flues, and made from clay or other composition; also, to economise fuel, they place in the same flues vessels for heating water, to supply the boilers of the same, the said vessels to be made of metal, with a covering of composition, such as clay, lime, or plaster of Paris, or may be made entirely from clay or other composition. Another part of their invention relates to the oiling of pistons and cylinders in locomotive steam-engines, and consists in a vessel for the lubricating material and tubes to attach to the same to convey oil to the interior of the pistons and cylinders. The said vessels and tubes have suitable plungers and stop-cocks, and are fixed conveniently for the engineer or fireman, so that when the steam is shut off and the piston in motion, by the aid of a lever or other apparatus, they will be able to let any suitable quantity of oil pass down the tubes to the pistons and cylinders, without having to alight from the engine. Another part of their invention relates to locomotive steam-engines, and consists in a stand or spring to be used as a balance, or otherwise, and so fixed that the engineer can stand on the same, and if incapable of stopping the engine through any cause, such as lightning, or other accident, or not standing upon the said stand, the balance and spring will then operate on the stoppage motion and shut off the steam; also, on the said engines they fix bells, with levers, springs, and catches attached, so that if the rails or points for the engine to pass over be out of place, or any danger on the line, the levers, springs, and catches will come in contact with other levers, springs, or other suitable apparatus fixed on the line or permanent way, and, giving warning to the engineer and fireman, thereby prevent accident to life and property.

LANHARRY HEMATITE IRON ORE COMPANY.

TO THE EDITOR OF THE MINING JOURNAL.

Sir,—I have on more than one occasion written you respecting the rich coal and iron mines at this place, and as frequently expressed my opinion on their increasing value; nor have I stood alone in this important matter, as may be seen by the reports of Messrs. Johnson, Bond, Swindale, Davies, and Blackwell, as published by the promoters of the Llantrissant Hematite Iron Ore and Coal Company about 12 months ago, which company was dissolved, as we are informed, through some misunderstanding between Mr. J. Cadman and his partner in the Trecastle lease, which property consisting of coal formed an adjunct to the great and important hematite and coal deposit of Lanharry. The unfortunate breaking up of the company referred to was occasioned, it is said, by the owner of the Lanharry leases being unable to give a free title to the Trecastle lease, or even showing a copy of an agreement entered into early in August (until the end of October) between himself and Mr. James Cadman, at which time, as we are told, the Stock Exchange had denounced the company; after which Mr. Cadman and Mr. Verity visited London, and gave a copy of the agreement to the solicitor of the company, which, alas! proved to be too late, as the vital spark of the company had then all but flown away, and that robust, giant company, which two or three months previously had given great promise, and warmed the hearts of the residents and mine proprietors of this place with great expectations, sunk never again to rise. Since which a limited company, with a capital of 70,000*l.*, has been formed in London to work the Lanharry Hematite Iron Ore and Coal Mines without the Trecastle property. Last Saturday being the weather-favoured day for the first visit of the directors to set the same going, sunshine and a clear sky welcomed the important beginning of the company,

The mines the company has taken are those which were held under lease by Mr. Reuben Plant, at low royalties, and for which that gentleman, or some one else, we are told, has received 40,000*l.* in paid-up shares from the company, which leaves 30,000*l.* capital in the hands of the directors to work the mines, which have been extensively proved. The hematite iron ore cropping out very near the south boundary of the property is found upon the mountain limestone, dipping to the north under the coal measures. It is known as the brown hematite iron ore, and contains near 60 per cent. of iron, and is as free, if not more so, from injurious matter to good iron-making than any other ore heretofore discovered. The coal the company has in this property consists of eight workable seams of the finest steam, house, gas, and coking coal in the country, a section of which I herewith hand you, which I hope you will be pleased to publish, as it will, no doubt, be of great interest to your readers, in addition to which the land



abounds with fire-clay of fine quality, and an unlimited quantity of clay ironstone; there is also, as before stated, the mountain limestone. The property is about one mile from the South Wales and Ely Valley Railways and station, and is approachable by a valley, up which it is intended to take a railway through this property to Cowbridge, and thence to the Bristol Channel, which will add another important outlet to this already highly favoured and well situated property. On Saturday the directors, accompanied by Mr. Plant, met parties desirous of contracting to raise and deliver (by carts until the rail is made to the mine) into trucks at the station, and entered into a preliminary agreement to contract to raise, &c., upwards of 35,000 tons. This property is about eleven miles from Cardiff, and has every advantage the proprietors can desire. I am informed that this company has not been advertised, but is formed under the Limited Liability Act, and the directors are known to be gentlemen of integrity, careful, and sound business habits. The secretary (Mr. S. J. Green) accompanied the directors for the purpose of organising and arranging with contractors, agents, &c.; after which the whole party returned, leaving behind them a host of hardy, well-trained, and willing miners anxious to do a good day's work for a fair day's money, with the hearty wishes of rich and poor for the success and well-being of the company.

In conclusion, I feel bound to join Mr. Johnson, who has so fully reported on these mines, in saying I never have had the pleasure of writing on any mining property of such value, having so many useful minerals contained on one estate, and to which may be added so many advantages for drainage, labour, and markets for all its minerals, being in the best possible position for sea and land transit and home consumption.

Lanharry, near Cowbridge, Glamorganshire, Nov. 16. Jacob Jones.

Water as a Fuel.—Attention has recently been drawn to the use of water as a fuel. The employment of its vapour has already been utilised in metallurgy, as an agent of oxidation in the roasting of certain minerals, particularly to facilitate the separation of arsenic and antimony compounds in metallic sulphurets. For several years attempts have been made to employ the caloric power of the hydrogen contained in water; and it is the same line of invention that Messrs. Maire and Voller have sought to utilise as a combustible in industrial furnaces, and particularly in metallurgic operations. Water, fed in a regulated and intermittent manner into a hot fire, is decomposed into oxygen and hydrogen. The former gas unites instantly with the carbon, and the hydrogen burning in presence of atmospheric air, produces a considerable heat in addition to that of the principal combustible. There results, then, a considerable augmentation of caloric without any addition of combustible, and consequently a more rapid fusion of metals and materials, and an economy of fuel which the authors of the process state varies from 40 to 50 per cent. Experiments and calculations have demonstrated that the heat absorbed by the decomposition of water is less than that furnished by the combustion of the gaseous products of decomposed water.—*London Review.*

Lett's Diaries.—In anticipation of the forthcoming International Exhibition, the publishers of these invaluable annuals have made several important additions to their well-known diaries, in order that they may be equally valuable to Englishmen and to foreigners: the French dates, embracing both the days of the weeks and months, have now been placed side by side with the English. A complete French almanack has likewise been prefixed to the diary, so that universally the volumes are now as desirable to Frenchmen to possess as they have hitherto been to Englishmen. More than this we cannot say in praise of their utility.

ST. JUST UNITED TIN AND COPPER MINING COMPANY
(LIMITED), IN THE PARISH OF ST. JUST, NEAR PENZANCE, IN THE COUNTY OF CORNWALL.

Incorporated under the Joint Stock Companies Acts, 1856 and 1857.
Capital £15,000, in 6000 shares of £2 10s. each. Deposit on application 5s., and 5s. on allotment.

DIRECTORS.

JAMES WRIGHT, Esq., C.E., 42, New Bridge-street, Blackfriars, London.
Col. BUSH, 55, York-terrace, Regent's-park, London.
THOMAS COOPER SMITH, Esq., 5, Warnford-court, Throgmorton-street, London.
} Directors of the Great Wheal Martha Mining Company.
Capt. GOLDICUTT (late 60th Rifles), Barton Villas, Barnsbury, London.
WENTWORTH LASCELLES SCOTT, Esq., M.S.A., Westbourne-park, Bayswater, London.
WILLIAM GREEN, Esq., Beverley-road, Hull, Yorkshire.
GEORGE EUSTICE, Esq., C.E., Hayle, Cornwall.

Bankers—Roberts, Lubbock, and Co., 11, Mansion House-street, London.
Batten, Carne, and Carne, Penzance, Cornwall.
Broker—Alexander Young, Esq., 3, Bartholomew-lane, or Stock Exchange, City, London.
Solicitors—Messrs. Hancock, Sharp, and Hales, 20, Tokenhouse-yard, City, London.
Auditors—Messrs. Cooper Brothers and Co., 13, George-street, Mansion House, London.
Secretary—Mr. E. Evans.

OFFICES,—23, MOORGATE STREET, CITY, LONDON.

This company is established for purchasing and working the extensive and valuable tin and copper mines, called the St. Just United, in the parish of St. Just, near Penzance, Cornwall, and situate in a district which is one of the most productive in the county, and has become distinguished by the rich returns and profitable results of mining operations carried on within it. The undermentioned mines, which are producing immense quantities of ores, and continue paying large dividends to the shareholders, are immediately adjoining and contiguous to the one under notice:—

Names of Mines now working, paying dividends.	No. of Shares	Amount paid per share.	Dividends paid per share.	Original outlay.	Total Amnt. of dividends paid.	Present market value.
Levant (tin & cop.)*	160	£2 10 0	£1091 0 0	£ 400 0 0	£174,560 0	£ 16,000 0
Botallack (tin & cop)*	200	91 5 0	445 15 0	18,250 0 0	89,150 0	48,000 0
Wheal Owles (tin)† ..	80	70 0 0	280 13 0	5,600 0 0	22,452 0	24,000 0
Balleswidden (tin)† ..	1624	11 15 0	12 5 0	19,082 0 0	19,894 0	19,488 0
Boscean (tin)†.....	240	20 10 0	33 0 0	4,920 0 0	7,920 0	12,000 0
Spearne Moor (tin)†..	280	31 17 9	9 15 0	8,928 0 0	2,730 0	12,600 0
Carnyorth (tin)†	2948	3 10 0	0 19 6	7,168 0 0	1,996 16	7,168 0
	4632	231 7 9	£1873 7 6	61,348 0 0	£318,712 16	£139,256 0

* Decomposed granite, slate, and greenstone. † Decomposed granite.

The above seven mines, on an outlay of £64,348 on the present working, have already paid back in dividends to the shareholders £318,712 16s.

As the before-mentioned mines stand prominent in the dividend-paying list, it may not be out of place to state also that Botallack Mine has given back to the shareholders in its former workings upwards of £250,000; Boscaswell Downs Mine upwards of £40,000, and again resumed working by a new company; Wheal Cunning upwards of £25,000; Boscean Mine upwards of £15,000; and Spearne Consols for an outlay of £1280 upwards of £10,000; thus making a total sum five mines have paid back in dividends to shareholders of £340,000.

PROGRESSIVE MINES.

Names of mines working.	Shares	Original outlay.	Market value.	Geological position.
Pendeen Consols (cop.)..	5000	£18,000 0 0	£ 28,780 0 0	Decomposed granite, slate, & greenstone.
Boscaswell Downs (tin)	1248	7,800 0 0	9,984 0 0	
Wheal Hearle (tin)	1024	7,680 0 0	15,360 0 0	
Boswedden (tin)	123	3,936 0 0	3,936 0 0	granite.
Bosorn (tin)	160	1,600 0 0	1,600 0 0	granite and greenstone.
		£ 38,416 0 0	£ 59,660 0 0	granite.

The setts are very extensive on the course of the lodes, and have been granted at the very moderate royalty of 1-24th dues for the term of 21 years, and upon the usual mining conditions. Fourteen rich tin and copper lodes and three cross-courses pass through this ground; some of these lodes have been wrought on, and, so far as they have been opened, have proved very productive, and will, no doubt, at a deeper level prove richer and lasting in their downward courses. This, in fact, has actually been the result in every mine in the district.

The geological position of this extensive and valuable mining property cannot be surpassed in the county. It is in beautiful strata, quite congenial for producing tin in the granite, and copper in the killas (clay-slate) immediately adjoining the granite, precisely of the same character as Botallack, Levant, Pendeen Consols, and other mines in the district.

These mines lie immediately adjacent to the rich Botallack, Levant, and other mines, all making large dividends, and producing tin in the granite inland, and copper ore in the lodes under the sea. All these mines exist under such geological parallels, that it is almost impossible to overlook the fact that they cannot fail under good management to become highly profitable; so much so, that in a long catalogue of all the surrounding mines, not one but has proved a most excellent investment for capital.

With reference to these especial mines, the lodes in them which have been worked for tin for centuries have proved so profitable that the waste heaps seem inexhaustible, and after being worked over the third or fourth time are now affording great profits.

There are very large quantities of tin now lying underground, which were broken when that metal was worth about £40 per ton, but it is now worth £76 per ton, and may consequently now be prepared for market at considerable profits.

There is an immense field of tin ground, containing 14 lodes, in the grant. These have been partially worked to an inconsiderable depth, about 60 fms., under adit; affording evidence that there remains an unlimited supply below, which may be worked to extraordinary profits under the favourable circumstances of the prevailing high prices of tin, low prices of mining materials, and the improved steam-power of the age.

Some very beautiful specimens of blistered copper ore may be seen in the offices of the company, broken in the last day or two of working in the 40, by the last workers; but the levels, although close to the copper formation, have not been carried into it, and some idea of its extent and value may be formed from the evidence of a similar range of copper ore ground worked in Botallack Mine, which has given as much as £24,000 per annum profit.

There can be no doubt that this property is actually teeming with certain and abundant mineral wealth, as it is the decided opinion of persons competent to speak on this mine, that when it shall have been set to work the profits that will accrue therefrom will place it in a position second to none in the district for the outlay.

The directors, after an unusually rigid enquiry and careful inspection of these mines, have the greatest confidence in bringing this property before the public, and they feel satisfied, by established facts, that a more promising and advantageous investment, and one more free from any speculative feature, has never before been offered to the public.

A reference to the section and sketch of the sett will better illustrate the position of the lodes of these mines.

The opinions of several mining engineers that have been consulted on the subject are, that a steam engine of 36 in. cylinder rotative expansive machine, for pumping and stamping may be erected, and the mine drained, for about £5000, when it is estimated that a small additional sum will carry the 40 and 62 westward into the copper ore ground, so as to give dividends to the shareholders almost at once, or at any rate within a very short period afterwards.

The capital of the company will consist of £15,000 in 6000 shares of £2 10s. each, depost 5s. per share on application, 5s. per share on allotment, and the future calls will not exceed 5s. per share at any one time.

The conditions of purchase for this valuable property are £2000 in cash, and £3000 in paid-up shares, the consideration for which embraces a lease of 21 years on highly favourable terms, the benefit of the work already done, with the plant, houses, materials, and elvans upon the mine; this will leave £10,000 for working capital, which is considered more than ample to carry out all the work necessary to place the mine in a dividend position.

The company having been completely registered with Limited Liability, no shareholder can, under any circumstances whatever, be made responsible for a greater amount than the shares to which he subscribes.

There are no special Articles of Association. Table B under the Joint-Stock Companies Act of Parliament having been adopted in its entirety.

To insure subscribers for any loss, which often ensues when a sufficient number of shares are not applied for, the directors bind themselves to return the whole of the deposit money, unless at least one-half of the shares are subscribed for.

A considerable portion of the capital has been already subscribed. and the directors will proceed to allot the shares as soon as they deem the requisite number applied for.

It is unnecessary to enter into further particulars in the prospectus, as the annexed reports of mining engineers and practical agents of the highest standing in the district, who have inspected these mines, will sufficiently corroborate the statements herewith submitted.

Some fine specimens of the ores from the various lodes may be seen at the offices.

Prospectuses, plans, forms of application for shares, and any other information, may be obtained of the secretary at the offices of the company, or from Alexander Young, Esq., Stock Exchange, London.

REPORTS.

Report of Capt. John Carthew, M.E., who was formerly the principal officer of the Bolivar Mining Association, Venezuela, South America; managing agent of Balleswidden, Pendeen Consols, Boscean; now of Spearne Consols and Carnyorth Mines:—

St. Just, near Penzance.—These extensive and valuable mines, which you have so fortunately secured, are situated in the parish of St. Just, about five miles north of the Land's End, and seven miles west from Penzance, in the county of Cornwall; they extend upwards of 400 fathoms east, 600 fathoms from north to south, and to an unlimited extent westward under the sea. The sett is traversed by fourteen well-defined and known rich tin lodes, bearing north by west and south by east in the granite; there are also two counter lodes crossing the entire sett, and where these have intersected the other lodes the "old men" had valuable and rich tin ground, yielding very large quantities of ore, above the level of the sea. Fifty years ago a deep level was taken up from high-water mark, extending eastward about 300 fathoms on the course of the lodes. A shaft was also sunk below the deep level, by the aid of a water-wheel, at Wheal Bellan, on the Buck lode, which, in extending eastward and westward on three lodes, good courses of tin were discovered, but in consequence of the want of sufficient water-power at all times to work their wheel, so as to keep the mine dry, and the low price of tin at this time (£38 to £40 per ton), made the working too expensive, and the adventurers were reluctantly compelled to abandon operations, although they had at that time cut a fine lode of tin on the counter lode (Wheal Owles), and had extended the 20 fathom level through valuable ore ground. The miners were working at a great disadvantage in sinking winzes in the bottom of the level on tribute. Ten parties were thus engaged in sinking, varying from 12 to 14 fms. in depth, leaving good courses of tin holding away and down in the bottom from 80 to 100 fms. in length, worth upwards of £20 per fathom. At this period there were more miners working in these mines than in all the other mines in St. Just parish. The 62 fm. level is sunk 30 fathoms below the ground discovered on Wheal Owles lode; and if an engine were erected in the present engine-house now on your mines, and suitable heads of stamps attached to the same, you could not fail to send tin to market within one month after the engine went to work. I never saw so fine a channel of mineral ground in the West of Cornwall. To comment on the district would be superfluous; suffice it to say that it is in a decomposed granite. The mines hitherto opened, and worked judiciously, have paid, and are now paying, large dividends regularly—viz., Balleswidden, Boscean, Wheal Owles, Botallack, Spearne Moor, Levant, Boscaswell Downs, &c. There is upwards of £1000 worth of tinstuff now on surface at St. Just United Mines, and the reports from the old miners declare that there is more than £2000 worth of tin broken underground, which can be taken away

and returned, as soon as the engine is set to work, at a very great profit. The point for copper mining, which I would strongly call your attention to, will be at the junction of the lodes running under the sea, where the granite and killas meet. The Bottallack, Levant, and Pendeen Consols copper lodes are parallel with those of the St. Just United to the north, and are situated on the same edge of the cliff, have precisely the same mineral character, are embedded in the same decomposed granite inland, and in the killas under the sea. A fine copper lode was discovered in the end of the 40, west of engine-shaft, from which some excellent stones of grey ore were broken. With such an extensive run of orey ground, embracing as it does such a cluster of lodes in the ends of the 20, 30, 40, and 62, and as they are converging and forming together a great trunk of copper in their junction in the great Savall's lode in this great trunk or copper lode, there can be no doubt, or two opinions, but that an immense amount of copper will be found westward in the killas under the sea. It will not be out of place if I mention here the great advantages that the new proprietary will derive from the work already done at surface and underground, and which will save time and money, and enable you at once to make returns and sales of ores, and I estimate the expenditure hitherto has been—sinking 10 shafts, making 535 fms., at £8 per fm., £4280; cutting down the engine-shaft, and making the same in good working order, 66 fms., at £10 per fm., £660; sinking the engine-shaft from the 40 to the 62 fm. level, 22 fms., at £20 per fm., £440; cutting whim-plat at the 62 fm. level, £30; driving cross-cuts to cut the lodes, £200; extending the 62 west into the copper ground, 40 fms., at £6 per fm., £240; ditto east in tin ground, 300 fms., at £4 per fm., £1200; removing debris for foundation of engine and boiler-house, and building the same, £220. Therefore, making a total of £7270 has been laid out in sundry work for the benefit of a new company; and I consider that in six months after the operations have fairly been commenced on the mines, the engine and stamps erected, and the work carried on vigorously, that the company will be in a position to return tin and copper, and also to pay regular dividends. Having been a superintendent mining agent at home and abroad upwards of 42 years, I feel proud in having the honour of recommending these mines to your notice, and I can with confidence say there is nothing again like them; and looking at the sett throughout, and duly considering every point connected with it, I cannot come to any other conclusion than that you possess a most valuable property. JOHN CARTHEW.

Report of Capt. THOMAS HARVEY, formerly agent of Penzance Consols, now of Beacon and Bosworthen Mine:—

Bosworthen Tin Mine, Sancreed, June 17, 1861.—In handing you my report of the St. Just United Tin and Copper Mines, I beg to state that they are situate in the most productive mineral district in Cornwall, that of the parish of St. Just, near Penzance, and that the locality has for ages been held in the highest estimation as such. I worked for many years in these mines, and from the knowledge I have of the different workings which were carried on at that time, as well as the character of the ground, my belief is that a better sett or mining property cannot be found. Even to this day parties have been removing stuff from the old burrows to water-stamps, and are realising good dividends quarterly. There are a great number of fine tin lodes running through the setts, as well as numerous branches of tin leading from one lode to another, and also caunter lodes; on each of these large quantities of tinstuff have been broken and sold to a good profit. Formerly the mines were worked by two companies. The eastern part was called Wheal Bellan, and the other, or western part, the Bounds. The mines were drained by a water-wheel at Wheal Bellan—the Bounds adventurers paying a yearly sum for draining their mines. Great amount of profit must have come to the adventurers at that time, for there were more miners employed in the setts than in all the other mines in the parish combined. Several winzes were sunk on the lodes throughout the mines on tribute, as deep as manual or hand labour would allow, in discharging the tinstuff, which proved so productive; but in consequence of there being only a horse-whim for drawing purposes, one of the lodes being 90 fms., and the other lodes 70 fms. from surface, the expense was found to be severely heavy, as tin was at £35 to £37 per ton only at that time. Had there been a steam-whim on the mines for drawing the stuff from the shafts, they never would have ceased working. The productive Wheal Owles lode being a caunter, will serve as a cross-cut for all the lodes in the sett. I am thoroughly convinced if a steam-engine were placed in the engine-house, already erected, with stamps' heads attached, and a steam-whim for drawing all the stuff (there being thousands of pounds worth of tin already broken, and which might be soon ready for market), and looking also at the fine situation in the western part of the property where the granite and killas unite, that these mines will prove equal to Botallack and Levant Mines, as excellent stones of copper ore are now to be found in the 40 west. All that is required is a mining-like course of operations, and then there can be no doubt as to the profitable results accruing to all who may be interested in this important undertaking, and I feel great pleasure in recommending these mines to you as a *bona fide* undertaking, and I unhesitatingly advise all to take an interest therein, as I believe it cannot be equalled in Cornwall. THOMAS HARVEY.

LAKE SUPERIOR, U.S.—Mr. G. W. HAMBLIN, Post Master, Negaunee Post-office, Marquette County, Lake Superior, U.S., has opened an office as above, for the purpose of supplying mineralogical specimens generally, but more particularly such as are peculiar to the district, to museums and collectors throughout the world. From his acquaintance with the different localities on the Lake, and with mining captains, he has facilities for collecting minerals, also for procuring the rarer sorts. Residing in the centre of the iron district, Mr. Hamblin can furnish specimens of ores of great beauty as cabinet specimens, of which the mammillary and stalactitic forms of hematite are worthy a place in any cabinet. He can also supply specimens of native copper and silver, with the accompanying minerals, many of which occur as crystals, forming rare objects of interest to the collector. Collections made up of all sizes and states of completeness, from the value of $25 (or £5 sterling) to $200. Letters of enquiry or conveying orders must be post paid.—— P.S.—On receipt of £5 sterling Mr. Hamblin will forward a set of iron specimens; also, native copper and silver.

Crystals as follows will be supplied at from $2 to $4 each:—Quartz, calc spar (Dog Tooth and other varieties), epidote, greenstone, prehnite (with copper), black oxide copper, anaicime, chlorastrolite (found only at Isle Royale), native copper (crystallised), calc spar (with radiated epidote), ripple marked quartz (from the metamorphic strata), and a large variety of others illustrative of the geology and mineralogy of this part of the world.

On account of convenience of remittance, the smallest collection which can be forwarded will be $25 (or £5 sterling).

INVESTMENTS IN BRITISH MINES.—MR. MURCHISON publishes a QUARTERLY REVIEW OF BRITISH MINING, giving at the same time the POSITION and PROSPECTS of the MINES at the end of each Quarter, the DIVIDENDS PAID, &c.; price One Shilling. RELIABLE INFORMATION and ADVICE will at any time be given by Mr. MURCHISON, either personally or by letter, at his Offices, No. 117, BISHOPSGATE-STREET WITHIN, LONDON, where copies of the above publication can be obtained.

OPINIONS OF THE PRESS ON MR. MURCHISON'S WORK ON BRITISH MINING, PUBLISHED IN 1856.

Mr. Murchison's new work on British Mines is attracting a great deal of attention, and is considered a very useful publication, and calculated to considerably improve the position of home mine investments.—*Mining Journal.*

The book will be found extremely valuable.—*Observer.*

A valuable guide to investors.—*Herapath.*

Mr. Murchison takes sound views upon the important subject of his book, and has placed, for a small sum, within the reach of all persons contemplating making investments in mining shares that information which should prevent rash speculation and unproductive outlay of capital in mines.—*Morning Herald.*

A valuable little book.—*Globe.*

Of special interest to persons having capital employed, or who may be desirous of investing in mines.—*Morning Chronicle.*

As a guide for the investment of capital in mining operations is inestimable. One of the most valuable mining publications which has come under our notice, and contains more information than any other on the subject of which it treats.—*Derby Telegraph.*

Parties requiring information on mining investments will find no better and safer instructor than Mr. Murchison.—*Leeds Times.*

To those who wish to invest capital in British Mines, this work is of the first importance.—*Welshman.*

This is really a practical work for the capitalist.—*Stockport Advertiser.*

This work enables the capitalist to invest on sound principles; in truth, it is an excellent guide.—*Plymouth Journal.*

All who have invested, or intend to invest, in mines, would do well to consult this very useful work.—*Ipswich Express.*

Persons desirous to invest their capital in mining speculations will find this work a very useful guide.—*Warwick Advertiser.*

We believe a more useful publication, or one more to be depended on, cannot be found. *Plymouth Herald.*

Those interested in mining affairs, or who are desirous of becoming speculators should obtain and carefully peruse the work.—*Monmouth Beacon.*

With such a work in print, it would be gross neglect in an investor not to consult it before laying out his capital.—*Poole Herald.*

Every person connected, or who thinks of connecting himself, with mining speculations should possess himself of this book.—*North Wales Chronicle.*

Mr. Murchison will be a safe and trustworthy guide, so far as British Mines are concerned.—*Bath Express.*

A very valuable book.—*Cornwall Gazette.* [*Glasgow Examiner.*

All who have invested, or intend to invest, in mines should peruse this able work.

Is deserving the attention of every one who seeks profitable investment of his capital.—*Brighton Examiner.*

Of great value to capitalists.—*Sunderland Times.*

It is full of carefully compiled and reliable information relative to all the known mines of the United Kingdom.—*Sheffield Free Press*

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"The 'Mechanics' Magazine' has from its establishment had an extensive circulation, and it communicates, for 4d. per week, far more valuable information, both scientific and practical, than was ever before placed within the reach of even those who could afford to pay six times as much for it."—LORD BROUGHAM.

THE IRONMONGER, AND METAL TRADES ADVERTISER. A Monthly Trade Circular, Entered at Stationers' Hall, and registered for transmission abroad. Office, 24, Bow-lane, London, E.C.

The *Ironmonger* is published on the last day of every month, and supplied to the trade only for the sum of 5s. per annum, post free. It contains Leading Articles, Mirror of the month, List of Contracts open, Extracts, Trade Reports, Price Currents and Statistics, Reports of Trade Meetings, &c., List of English and Foreign Patents, and Novelties (illustrated when necessary), Correspondence, Gazette, and other matters interesting to the trade, specially selected and arranged for its columns.

Manufacturers and wholesale houses will find this journal the best possible medium for bringing their articles before the trade, no expense being spared in its introduction at home and abroad, wherever the English language is spoken, and a permanent English and Foreign circulation of several thousands per month being guaranteed. Scale of charges for advertisements:—Page, 35s.; half page, 20s.; quarter page, 12s. 6d.; per word, 1d. Assistants' advertisements, not exceeding 24 words, will be inserted for 1s. each.

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Having been very successful in MANUFACTURING and REPAIRING the PATENT TUBULAR TUYERES, and securing our patent for a further term of years, we have great pleasure in offering them to the public, at a considerable REDUCTION IN PRICE.

Our manner of repairing will make them as LARGE and GOOD AS WHEN NEW (which is not the case with the ordinary tuyere) for half the first cost, when there is not more than two coils destroyed at the nozzle, all parties returning them carriage paid, and are confident they will be the cheapest and best ever offered to the mining world.

The PATENT TUBULAR TUYERES having maintained a most honourable reputation since their introduction, and been thoroughly proved to answer all the purposes set forth by the proprietors (when properly treated), it is, therefore, deemed unnecessary to publish a list of the patrons, or enumerate cases of their success. Although by such a procedure very much might be said in their favour, yet the readers would never be so fully convinced of their sterling worth as by a practical trial.

The future scale of prices will be as follows, including sockets:—

No. 1 Tuyere,	16 in.	long	28s. each.
No. 2	18	"	32s. "
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This company is PREPARED to GRANT LICENSES on moderate terms for the USE of their PATENT for STEELING RAILS, POINTS, CROSSINGS, MACHINERY, and EVERY DESCRIPTION of IRONWORK.

The process, which is exceedingly reasonable in cost, and gives the most extraordinary durability to the material, has been highly approved of by the following gentlemen, firms, and companies, several of whom have extensively adopted the valuable improvement:—

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JOHN BOURNE, Esq.
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THOS. E. HARRISON, Esq.
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THE NORTH-EASTERN RAILWAY COMPANY.
MESSRS. STEPHENSON AND CO.
THE EAST LANCASHIRE RAILWAY COMPANY.
THE GREAT NORTHERN RAILWAY COMPANY.
THE MIDLAND RAILWAY COMPANY.
THE METROPOLITAN RAILWAY COMPANY have ordered a large quantity of rails by this process.

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THE EBBW VALE COMPANY, SOUTH WALES.
MESSRS. LEVICK AND SIMPSON, NEWPORT, MONMOUTHSHIRE.
MESSRS. LLOYD, FOSTERS, AND CO., WEDNESBURY.
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Applications for Licenses can be made to R. COOKE, Esq., at the company's offices, No. 7, Size-lane, London, E.C., where also testimonials and other information may be obtained.

BY HER MAJESTY'S ROYAL LETTERS PATENT.

BUTLIN'S APPARATUS FOR SUPERHEATING STEAM, by which means a SAVING of THIRTY PER CENT. in the CONSUMPTION of FUEL is EFFECTED, TWENTY-FIVE PER CENT. LESS WATER is REQUIRED to FEED BOILERS, a GREAT INCREASE of POWER is OBTAINED, and the BOILER is RENDERED MORE DURABLE. The above patent can be applied to any boiler, either new or old, and to every description of engine. Most extraordinary reports have been received from parties who have used it, equally satisfactory to the following letters, and any further particulars may be obtained by applying to the patentee,

W. BUTLIN, VULCAN WORKS, WESTON STREET, NORTHAMPTON.

TESTIMONIALS.

Leadenhall-street, London, E.C., July 3, 1860.

DEAR SIR,—Having applied your patent steam superheater to the boiler of our steamship, *City of Nantes*, we have great pleasure in being able to state that your apparatus effects a saving of at least 30 per cent. in the consumption of fuel, besides giving additional speed upon the screw. We do not hesitate in giving our opinion that your invention is a most important one, and one which must come into general use. We approve of your arrangements for admitting saturated steam with the superheated, to regulate the temperature at pleasure. Your plan of filling the heater with water during the time steam is being got up we think is quite a new idea, and remedies one of the great objections to superheaters generally—the rapid destruction of the tubes by the fire while steam is getting up. You are at liberty to make what use you please of this letter, as we think so valuable an invention ought to be made known to the steam shipping interest of this country. We are, dear Sir, your's truly,

W. Butlin, Esq., Northampton. —— LANGTON AND WILSON.

Little Houghton, Northampton, July 29, 1861.

DEAR SIR,—We have given our engine a sufficient test, both in thrashing and sawing, since the introduction into it of your superheater, to enable us to speak confidently of the great improvement made by the alteration. We believe that your advertisements do not exaggerate the excellence, in any respect, of your patent. Many respectable parties who witnessed the working of the engine are willing to bear testimony to the truth of our statements. We remain, dear Sir, yours very truly,

—— SMITH AND THURSTON.

Naseby, Northampton, Aug. 24, 1861.

SIR,—I have much pleasure in being able to state that since your patent steam superheater has been applied to my engine I find a considerable reduction in the consumption of fuel, much less water is required to feed it, and a great increase of power is obtained. I am much pleased with the alteration. —— Yours truly, L. WILFORD.

Earl's Barton.

SIR,—I am well satisfied with the alteration made in my engine, as it takes less coal and water since your heater has been introduced into it.

Yours truly, CHRISTOPHER COLEMAN.

BASTIER'S PATENT CHAIN PUMP, APPARATUS FOR RAISING WATER ECONOMICALLY, ESPECIALLY APPLICABLE TO ALL KINDS OF MINES, DRAINAGE, WELLS, MARINE, FIRE, &c.

J. U. BASTIER begs to call the attention of proprietors of mines, engineers, architects, farmers, and the public in general, to his new pump, the cheapest and most efficient ever introduced to public notice. The principle of this new pump is simple and effective, and its action is so arranged that accidental breakage is impossible. It occupies less space than any other kind of pump in use, does not interfere with the working of the shafts, and unites lightness with a degree of durability almost imperishable. By means of this hydraulic machine water can be raised economically from wells of any depth; it can be worked either by steam-engine or any other motive power, by quick or slow motion. The following statement presents some of the results obtained by this hydraulic machine, as daily demonstrated by use:—

1.—It utilises from 90 to 92 per cent. of the motive power.
2.—Its price and expense of installation is 75 per cent. less than the usual pumps employed for mining purposes.
3.—It occupies a very small space.
4.—It raises water from any depth with the same facility and economy.
5.—It raises with the water, and without the slightest injury to the apparatus sand mud, wood, stone, and every object of a smaller diameter than its tube.
6.—It is easily removed, and requires no cleaning or attention.

A mining pump can be seen daily at work, at Wheal Concord Mine, South Sydenham, Devon, near Tavistock; and a shipping pump at Woodside Graving Dock Company (Limited), Birkenhead, near Liverpool.

J. U. BASTIER, sole manufacturer, will CONTRACT to ERECT his PATENT PUMP at HIS OWN EXPENSE, and will GUARANTEE IT FOR ONE YEAR, or will GRANT LICENSES to manufacturers, mining proprietors and others, for the USE of his INVENTION.

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London, Oct. 10, 1859. Hours from Ten till Four. J. U. BASTIER, C.E.

SARL AND SONS, 17 and 18, CORNHILL, respectfully SOLICIT a VISIT to their magnificent ESTABLISHMENT. The ground floor is more particularly devoted to the display of FINE GOLD JEWELLERY, GOLD and SILVER WATCHES, and FINE GOLD CHAINS.

The SILVER PLATE DEPARTMENT is in the gallery of the building, and consists of every article requisite for the table and sideboard.

In the magnificent show-rooms is displayed a large and beautiful stock of ARGENTINE PLATE, the manufacture of which has stood the test of 20 years' experience.

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Spain is determined to share the advantages resulting from an extended commercial intercourse with England. The Vintage Wine Company import Spanish wines at such prices as to induce customers to give the preference to sherry instead of to the light wines of France.—*Court Circular.*

Not only excellent in quality and flavour, but remarkable for cheapness—18s. per dozen for a genuine mild sherry for the dinner table.—*Sun.*

A pure, sound, and palatable wine, and far more fitted for our climate than the thin acrid clarets of France.—*Press.*

A really good sherry.—*Morning Star.*

XERES COMIDA SHERRY, Soft, fine body, age and flavour, and genuine.

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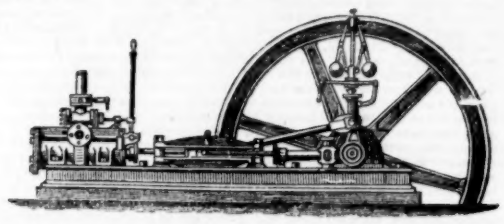

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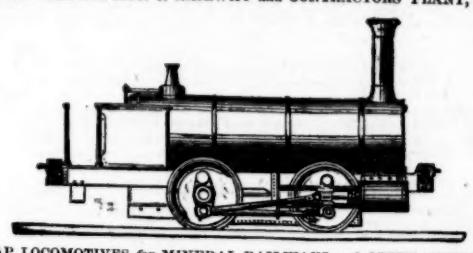

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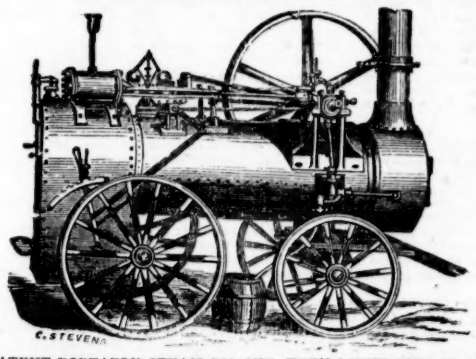

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